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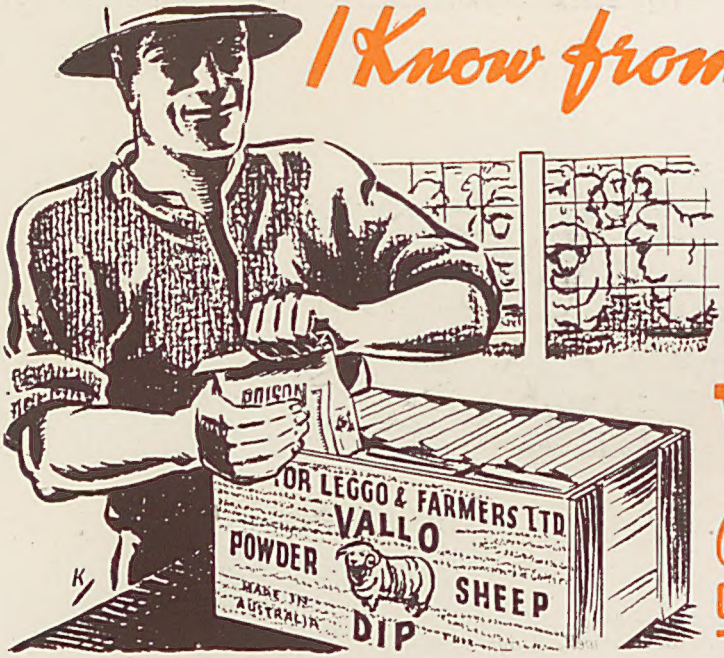

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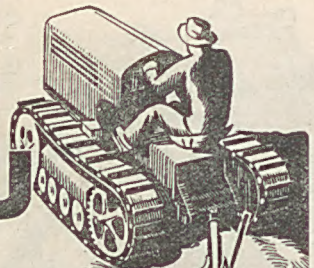

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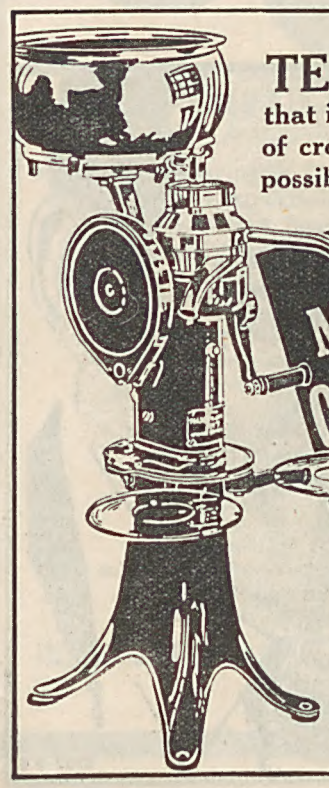

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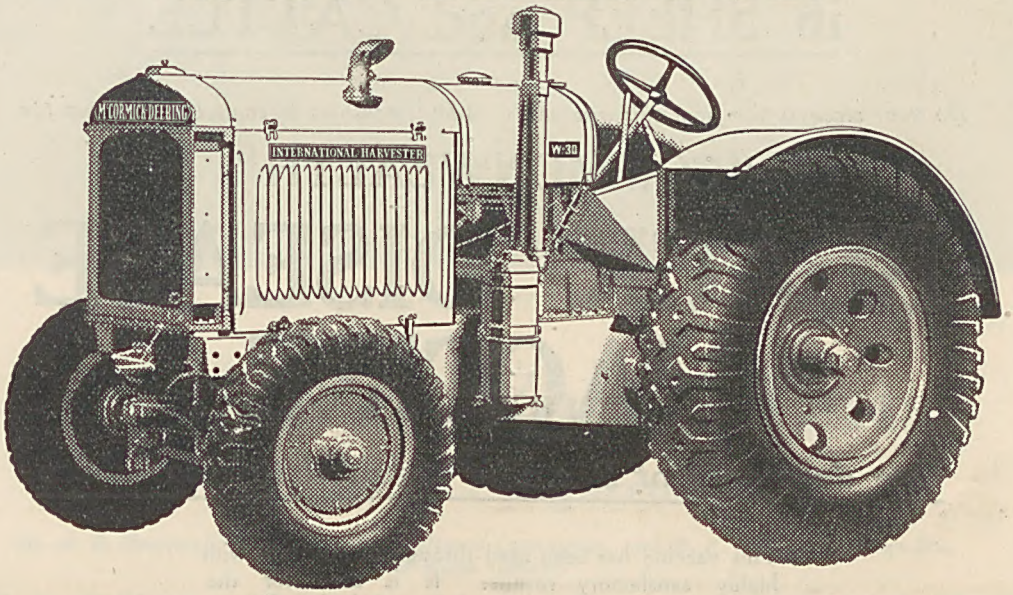

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Wimmera Wheat Tests

Trials at Longerenong

By A. B. Hackwell, B.Agr.Sc., Agricultural Instructor, and B. F. McKeon, B.Agr.Sc., Science Field Officer.

THE Cereal Experiment Station conducted by the Department of Agriculture at the Longerenong Agricultural College, in co-operation with the Council of Agricultural Education, is the main research institute in the Wimmera district for the investigation of problems associated with wheat farming in that area. The college is located at Dooen, eight miles east of Horsham.

With its black fertile plains especially adapted to wheat growing, the Wimmera district is noted for its high productive capacity. This district normally produces 38 per cent. of the Victorian wheat crop. During the past decade, the annual wheat production in the Wimmera was $15\frac{3}{4}$ million bushels, representing an average yield of 18.3 bushels per acre. In favorable seasons, yields of 40 bushels per acre are not uncommon on many farms in this area. The annual rainfall at Longerenong College is $16\frac{1}{2}$ inches (average 46 years), of which $9\frac{1}{2}$ inches are normally received in the growing period of the wheat crop, from June to November inclusive. The plots are located on strong clay loam, typical of the black soil of the Wimmera plains.

The experimental work at this station commenced in 1907, and in the early years was confined mainly to the breeding and development of wheat varieties. Permanent field tests were first established in 1912, and from time to time the experiments have been revised and new investigations, including variety, rotation and soil cultivation trials, were introduced. In recent years the scope of the work has been considerably extended, and the method of experimentation used in the field has been modified in accordance with the latest scientific advances. At the present time, 120 acres are devoted to the tests, which embody investigations on all the main features associated with wheat farming. The experiments and demonstrations at Longerenong College have been of material assistance in providing information on problems involving the maintenance and improvement of wheat production in the Wimmera. Valuable results have been obtained to date, but many problems remain

---

The Departmental Officers resident at Longerenong College are R. S. McTaggart, Field Officer, and M. Moody, Field Assistant.

Journal of Agriculture, Victoria—December, 1938.

to be solved. The following report outlines the investigations in progress with wheat and oats and summarizes the results of the tests in past years. In addition to the work at this station, subsidiary experimental plots are conducted by the Department of Agriculture at three other centres in the Wimmera, namely Salisbury (near Nhill), Donald and Charlton.

Tests in Progress.

At Longerenong College this year, the total area sown with plots was 66 acres. In all, there were 1,000 individual plots and 1,000 single stud rows. The experiments conducted were :—

A. Experiments with Wheat (on fallow)—

(1) Wheat Variety Trial, with 6 standard wheats and 22 new crossbreds and selections.

(2) Time of Sowing Trial—Five varieties each sown with two manurial rates at two times of sowing (normal and late).

(3) Wheat Grazing Trial—to compare yields on grazed and ungrazed plots of three varieties each sown at three rates of seeding.

(4) Fallow Cultivation Trials—Fifteen treatments under test.

(5) Wheat Manurial Trials—(*a*) permanent test with twelve treatments ; (*b*) replicated test with six treatments.

(6) Zinc Manurial Trials—(*a*) Five amounts of zinc sulphate applied alone and in combination with superphosphate ; (*b*) Tests with various forms of zinc on wheat and other crops.

(7) Mineral Deficiency Trial—With seven minerals or elements (copper, boron, iron, &c.).

(8) Pickling Tests—(*a*) Yield trial to test the effect of dry pickling powders ; (*b*) To compare the efficacy of various powders in the control of ball smut.

(9) Tests with new types of seed and manure distributors.

(10) Crop Growth Section—To study the influence of seasonal conditions on wheat plant development.

B. Experiments with Oats on Stubble—

(1) Oat Variety Trial with seven varieties.

(2) Manurial Trial with seven treatments.

(3) Residual Manurial Trial—To test the residual effect on oats of nine manurial treatments applied to wheat plots last year.

(4) Zinc Sulphate Tests—Six treatments with zinc and superphosphate.

(5) Mineral Deficiency Trial, with seven minerals or elements.

C. Cereal Breeding and Seed Production—

(1) Stud Rows—1,000 single rows of wheat, oats and barley.

(2) Selection Plots—84 plots sown with new crossbreds and selections of wheat and oats.

(3) Seed Multiplication Plots—To provide seed supplies for bulk areas.

D. Permanent Rotation Tests—

Investigations with nine rotation systems, with wheat as the principal crop.

Lay-Out of the Experiments.

In order to overcome soil variations in the paddock, many of the above tests are conducted under a replicated system of plots known as the Randomized Block method. By this system, a small plot of each variety or treatment is sown side by side to form a block. The block is repeated (or replicated) four times, and the yields of each treatment are obtained by averaging the yields of the four individual plots. The order of the treatments in each block of plots is randomized, that is, they are not arranged in the same sequence. The replicated system of experimentation has a higher degree of accuracy than the simpler method of testing by single plots.

In view of the effect that varying factors, such as time of sowing, rate of seeding or manuring, may have on the results of a trial, it is of interest and importance that these factors should be given due consideration. Accordingly, in some of the trials, where such information was required, the experimental layout was modified along these lines and a number of composite trials, incorporating varying factors, was sown. This improved method of experimentation is a modification of the randomized block method and is known as a Factorial Design.

Seasonal Conditions, 1938.

With extended drought conditions throughout the spring months, the 1938 season has been the worst experienced for the past 24 years. The total rainfall at the College from January to mid-November was 8½ inches only, whereas the normal registration for this period is 15 inches. The spring rains failed almost completely, the rainfall during August, September, October to mid-November being only 125 points. Hot parching winds during this period intensified the adverse conditions.

The season commenced with a very dry autumn, but with normal rains in June and July the crops germinated well and made good growth in the winter months. In the drought conditions which developed throughout the spring, the wheat plots on fallow held out surprisingly well, but in the continued absence of rain in October and early November, these crops gradually declined and will return very light yields only. The oat plots on stubble land failed completely and no crop will be harvested.

In common with most portions of the Wimmera, the conditions at Longerenong this year have been particularly severe. The ultimate returns from the plots will provide interesting data as to the relative yielding ability of the different varieties and treatments under extremely adverse conditions.

RAINFALL RECORDS—LONGERENONG COLLEGE.

—	Average 46 Years at College.	Average 13 Years 1925–30 Plot Fields.	1938.
January ..	86	105	133
February ..	82	93	64
March ..	102	73	6
April	129	122	94
May	179	146	53
June	195	144	189
July	161	174	192
August ..	167	142	44
September ..	164	127	49
October ..	172	149	20
November ..	102	84	..
December ..	126	153	..
Total Points..	1,665	1,512	Total to mid-Nov. 856

RESULTS OF EXPERIMENTS.

Wheat Variety Trials.

The varieties under test in the wheat variety section are reviewed each season, and new wheats are included from time to time to replace those discarded on account of their lower yielding ability or other inferior characters. In recent years several new crossbreds, which have been prominent in preliminary tests, have been promoted to these main trials. Special attention is paid to varieties possessing superior flour quality and some of these have also been included.

Twenty-eight varieties are under replicated test this year, namely Ghurka, Baldmin, Dundee, Bencubbin, Nizam, Free Gallipoli, Ghurka Selection, and progeny of the following crossbreds :—

Major x Free Gallipoli, Major x Ranee,
Sepoy x Free Gallipoli, Wannon x Ghurka.
Ranee x Free Gallipoli, Ghurka x (C. x M. x G.),
Nizam x Free Gallipoli, Federation x Free Gallipoli,
Free Gallipoli x Sepoy, Rajah x Gallipoli.

The tests were sown on 30th June, with 75 lb. of seed and 1 cwt. of superphosphate per acre. The average yields obtained in past years are set out in Table I. :—

TABLE I.—WHEAT VARIETY TRIALS.

Average Yield in Bushels per Acre.

Variety.	Average, Ten Years (1928–37).	Average, Two Years (1936–37).
Baldmin	..	52·0
Ghurka	43·1	49·7
Nizam	42·4	49·4
Free Gallipoli	41·7	48·8
Dundee	..	48·4
Wannon*	40·4	48·4
Federation*	39·1	45·6
Baringa*	..	44·0
New Crossbreds—		
Nizam x Free Gallipoli L5774 ..	..	57·1
Ghurka x (Cur. x Maj. x Gall.) W5543	..	55·2
Ranee x Free Gallipoli W5899 ..	..	54·2
Major x Ranee W6025	..	53·8
Major x Free Gallipoli W 5817 ..	..	53·7
Rajah x Gallipoli	..	50·8
Free Gallipoli x Sepoy L5053 ..	..	45·8

* These varieties have now been excluded from this trial. Other wheats previously tested and discarded in recent years include—Ranee 4H, Sepoy, Mogul, Rajah, Nabawa, Penny, Currawa, Huf's Imperial, &c.

Ghurka has been the leading variety in ten years' tests at Longerenong and has proved itself a very suitable wheat for most districts of the State. It is a free-stripping variety, mid-season to late in maturity with a short, strong straw. It is very resistant to flag smut and less affected by rust than are other varieties, In regard to flour quality Ghurka is in the low strength group, but is definitely superior to Free Gallipoli, the variety which has returned the third highest yield over the past ten years. Nizam also has yielded well under Longerenong conditions.

The results obtained over a period of two years, with Baldmin, Dundee and Baringa and seven of the more prominent new crossbreds are

Note—The yields per acre quoted in this report are those actually harvested from the plots. Such yields are considerably higher (up to 20 per cent.) than would be the case if it were not necessary to have paths between the plots.

Wheat Variety Trials.

also set out in Table I. During this period Baldmin was the heaviest yielding wheat among the named varieties. Dundee, on the other hand, returned a slightly lower yield than Ghurka, while Baringa was appreciably inferior. Another feature of interest was that several of the new crossbreds gave a higher yield than the standard wheats, in the two seasons under review.

Wheat Varieties Recommended.

The wheat varieties which are recommended for the Wimmera, based on results of tests at various centres, are set out in the accompanying table.

——	Main Sowing.	Limited Sowing.
Wimmera black land ..	Ghurka	Free Gallipoli Baldmin Nizam
Wimmera red and mixed land	Ghurka	Ranee 4H Free Gallipoli Nizam Dundee Baldmin

Ghurka is now the principal variety in the Wimmera, its general adoption in place of Free Gallipoli having resulted in an improvement both in yield per acre and quality. This short-strawed variety is recommended for the main sowings on (1) black land, and (2) red and mixed land.

In recent years, the medium strong wheat Baldmin has given good yields in the Wimmera experimental plots at Longerenong, Salisbury, and Donald, having been superior to Free Gallipoli and about equal in yield to Ghurka. The use of Baldmin would result in a further improvement in the quality of Wimmera wheat, but, until it has proved itself over a somewhat longer period, it is recommended for limited sowings only. Baldmin is an early-maturing, tall-growing variety, but it has a tendency to weak straw.

Dundee, another medium strong variety (but inferior to Baldmin in grain and flour quality) has been tried by many Wimmera growers in the past two years with good results in some cases, but only moderate in others. Departmental tests to date do not indicate that it is the equal of Ghurka in yield on black land. As yet, the tests are incomplete, and, in the meantime, the use of Dundee is not recommended for that type of soil.

On red ground, Dundee has given better results during the short period of the tests, and if it maintains its satisfactory yield, it will receive the Departmental approval. In the meantime, limited sowings only are recommended.

Table II.—Ten Principal Wheat Varieties Sown in the Wimmera, 1937–38—Percentage of Total Wheat Area (1936–37 Figures in Brackets).

Variety.	Percentage.
Ghurka	55·0 (60·0)
Free Gallipoli	15·4 (18·4)
Dundee	13·9 (4·0)
Ranee 4H	8·9 (10·6)
Bencubbin	1·7 (1·0)
Nizam	1·0 (1·0)
Bobin	0·8 (0·5)
Federation	0·6 (1·0)
Baringa	0·4 (0·5)
Rajah	0·4 (0·5)
All other	1·9 (2·5)
Total wheat area	863,979 acres

The earlier maturing variety Ranee 4H has also proved comparatively unsuitable for black land in the Wimmera, but is recommended second to Ghurka for red land.

Nizam, another short-strawed wheat, and of comparatively low quality, has yielded well, but is not considered as suitable as Ghurka for extensive sowing. Free Gallipoli is recommended only where a strong-strawed variety of medium height is required for black and mixed land.

Time and Rate of Seeding Tests with Wheat.

Time and rate of seeding tests with wheat, which were conducted over a period of 22 years from 1914–35, included five rates of seeding ranging from 45 to 120 lb. per acre. The plots were sown in duplicate, one section being cropped early in the season (late May to early June) and the other several weeks later (July), thus affording a comparison between early and late sowing.

The average yields obtained over the period of the test are shown in Table III.

TABLE III.—TIME AND RATE OF SEEDING TESTS.

Rate of Seed per Acre.	Average Yield 22 Years, 1914–35. Bushels per Acre.		
	Early Sown (Late May Early June).	Late Sown (July).	Difference in Favour of Early Sowing.
45 lb. ..	40·3	34·6	5·7
60 lb. ..	41·0	37·2	3·8
75 lb. ..	40·7	37·4	3·3
90 lb. ..	40·8	38·3	2·5
120 lb. ..	39·1	37·8	1·3
Average..	40·4	37·1	3·3

There are several points of interest arising from the results of this experiment.

1. Despite the relatively long seeding period which is possible on Wimmera black ground due to favorable soil texture even in mid-winter, it is desirable to sow as soon as possible after the middle of May consistent with clean crops being obtained.
2. When early sown, but small differences in yield are obtained over the whole range of the five seeding rates 45 to 120 lb. per acre; 60 to 70 lb. being a most suitable quantity to use.
3. As the time of seeding becomes later the rate of seeding may profitably be increased, though not above 90 lb. per acre.

The above experiment has been finalized and this year a new Time of Sowing Test was commenced.

The present trial is of a composite type and is designed to compare the yield of five varieties each sown at two periods, normal and late. The effect of the manurial dressing in relation to time of sowing is also under test, and each variety was sown with 1 cwt. and 1½ cwt. of superphosphate per acre.

The five varieties being tested are Ghurka, Baldmin, Nizam, Free Gallipoli and Federation. The normal-sown section was drilled on 4th July, and the late-sown section on 4th August—the rate of seed being 75 lb. per acre.

Visitors being addressed by an officer of the Department of Agriculture at Field Day.

Wheat Grazing Trials.

A wheat grazing trial was commenced in 1936 to determine the effect on yield of grazing the wheat crop with sheep in late winter and to compare the behaviour of different varieties under grazed and ungrazed conditions. Since the rate of seeding has an important effect on the feed produced, this feature was also incorporated in the trials, and each variety was sown at three rates of seed, 60, 90 and 120 lb. per acre. A uniform application of superphosphate, 1 cwt. per acre, was used throughout the test.

In the first year of the experiment the varieties tested were Ghurka, Free Gallipoli and Wannon. The grazed section was fed-off with sheep on two occasions, 11th August and 8th September, and the other section was ungrazed. In 1937, the variety Wannon was replaced by Baldmin and the grazed plots were fed-off on 16th August and 7th September.

TABLE IV.—WHEAT GRAZING TRIALS.
Yields in bush./ac.

	1936.			1937.		
Rate of Seed lb./ac. ..	60	90	120	60	90	120
	Ghurka.			Ghurka.		
Ungrazed ..	57·0	58·5	59·9	51·5	51·8	54·4
Grazed ..	48·5	51·0	53·9	46·4	47·7	48·2
Decrease ..	8·5	7·5	6·0	5·1	4·1	6·2
	Wannon.			Baldmin.		
Ungrazed ..	51·6	53·0	54·8	50·2	53·3	53·3
Grazed ..	43·0	48·9	50·9	40·8	44·3	45·2
Decrease ..	8·6	4·1	3·9	9·4	9·0	8·1
	Free Gallipoli.			Free Gallipoli.		
Ungrazed ..	58·1	54·5	56·1	45·6	46·0	45·4
Grazed ..	53·0	50·8	51·7	43·8	46·2	45·7
Decrease ..	5·1	3·7	4·4	1·8	..	..

The results obtained each season are set out in Table IV. and show that, in 1936, there was a decreased yield in every case due to the grazing and with each variety the loss was greatest with the lowest rate of seeding. In 1937, the feeding-off again resulted in an appreciable reduction in yield in the case of Ghurka and there was a very marked reduction with Baldmin. With Free Gallipoli, the loss occurred only in the plots sown with the lighter amount of seed (60 lb. per acre).

Summarizing the two years' results, the experiments show that, under the particular seasonal conditions experienced in 1936 and 1937, the feeding-off brought about a reduction in the wheat yield. In both seasons a smaller loss occurred with Free Gallipoli than with the other varieties. The tests, however, will be continued over an extended period of years before definite conclusions are drawn. This season the plots made good growth in winter and were fed-off heavily on 22nd August and lightly on 2nd September.

Fallow Cultivation Tests.

Fallow cultivation trials have been conducted since 1927 to furnish information as to the best methods of preparing fallow for wheat-growing and to compare the effiiciency of the principal systems of fallowing employed by Wimmera farmers. Twenty quarter-acre plots are devoted to the experiment and fifteen cultural treatments are under investigation. The summarized results are shown in Table V:—

TABLE V.—FALLOW CULTIVATION TESTS.

Treatment.	Wheat Yield, Average 10 Years.
	bus./ac.
Summer fallow (average four plots) ..	37·9
Winter fallow (average three plots) ..	36·7
Late fallow (October)	26·1
Sheeped winter fallow (no cultivation, August till autumn)	21·8
Non-fallow—not ploughed till autumn ..	11·4

In the ten years of test there has been no uniform superiority in yield from either summer or winter fallow, as each type has shown to advantage in different years. Over this period summer fallow has given an average yield of 37·9 bushels per acre, and winter fallow 36·7 bushels per acre. It is probable that increased yields from summer fallow would be more apparent on land where weeds are more prevalent than on the experimental site.

One of the most interesting features of the tests is the reduced yield resulting from late fallow. Land ploughed in October has yielded 26·1 bushels per acre, a reduction of 10·6 bushels compared with winter fallow. The tests emphasize the importance of early fallowing in the Wimmera, and demonstrate the advantage gained by completing the fallowing in July–August. A practice recommended is that sufficient area of summer

fallow should be prepared to permit an early completion of the fallowing programme.

The advantages of adequate cultivation are also demonstrated and the results show that the use of sheep alone during the spring and summer months is not sufficient preparation for Wimmera land.

TABLE VI.—FALLOW CULTIVATION TESTS.

Detailed Treatments—Average Yield Ten Years.

Treatment.	Wheat Yield, Average 10 Years.
	bus./ac.
Summer fallow—	
March, ploughed 3½ inches, scarified end July 3½ inches* .. (average four plots)	37·9
March, ploughed 5 inches, scarified end July, 3½ inches*	37·8
March, scarified 3½ inches, scarified end July 3½ inches*	37·7
March, spring-toothed 2 inches, ploughed July, 3½ inches*	38·4
March, ploughed 3½ inches, scarified end July 3½ inches worked to 3½-in. mulch ..	38·1
March, ploughed 5 inches, scarified end July, 3½ inches. worked to 3½-in. mulch ..	38·8
May, ploughed 3½ inches, scarified end July, 3½ inches*	38·3
Winter fallow—	
July, ploughed 3½ inches, scarified August, 2½ inches* .. (average three plots)	36·7
July, ploughed 3½ inches, scarified August, 3½ inches, worked to 3½-in. mulch ..	36·9
July, ploughed 5 inches, scarified August, 3½ inches, worked to 3½-in. mulch ..	36·9
July, ploughed 3½ inches, scarified August, 2½ inches,* knife-barred dry in January	36·4
July, ploughed 3½ inches, scarified August, 2½ inches,* disked deeply dry in January	35·2
Late fallow, non-fallow, etc.—	
October, ploughed 3½ inches, scarified November, 2½ inches*	26·1
Non-fallow, cultivated or ploughed after 1st April	11·4
July, ploughed 3½ inches, scarified August, 2½ inches, then sheeped till autumn, cultivated April	21·8

* These plots subsequently received *standard treatment*, i.e., scarified 2½ inches deep to kill weeds and form seed-beds in August and September; sheeped during spring and springtoothed or harrowed as required to maintain 2½-in. mulch and level consolidated seed bed. Scarified and harrowed in late autumn before sowing.
Seed—Ghurka sown at 75 lb. per acre. Super. 1 cwt. per acre.

Soil Moisture and Plant Food Studies in Fallows.

In conjunction with the cultivation tests where the yields resulting from various cultural practices are compared, systematic studies have been made since 1928 to determine the extent of the accumulation of soil moisture and plant food. Particular attention has been given to soil moisture, nitrogen, phosphoric acid and potash in land prepared by various methods. Bacteriological work, with special reference to the development of available nitrogen, has also been carried out.

The work has emphasized the importance of soil moisture conservation by fallowing and of weed control during the fallow period. The studies have shown that weed growth has a very significant effect in depleting both soil moisture and available nitrogen in the fallow.

Special interest is attached to the soil moisture studies under the drought conditions this year, particularly in comparison with the previous dry seasons, 1929 and 1914.

Determinations of soil moisture at intervals, to a depth of 2 feet, have shown that in late October of the present year, the soil moisture was at a lower level than at the corresponding period in 1929, *but not so low as it was during the drought of* 1914.

Wheat Manurial Trials.

Permanent Test.—The object of the permanent test is to demonstrate the effects of various fertilizers on the wheat crop. The trials are located on black land and have been conducted for 26 years. Three sites are used for the experiment and each is devoted consecutively to bare fallow, wheat and oats. The quantities of the various manures applied, together with the average yields obtained since 1912, are shown in Table VII:—

TABLE VII.—PERMANENT WHEAT MANURIAL TRIALS.

Average Results 26 Years, 1912–38.

Manurial Treatment per Acre.	Average Yield.
	bus./ac
No manure	34·5
Super. ½ cwt.	38·7
Super. 1 cwt.	40·2
Super, 2 cwt.	41·0
Super. 1 cwt. + lime 5 cwt.	39·7
Super. 1 cwt + lime 10 cwt.	39·1
Super. 1 cwt. + nitrate of soda 40 lb. applied with the seed	39·4
No manure	34·4
Basic slag, 1 cwt.	36·1
Super., 1 cwt.	39·5
Super. 1 cwt. + nitrate of soda, 40 lb. + potassium sulphate, 40 lb.	39·4
Super. ½ cwt. + basic slag, ½ cwt.	38·3
Super. 1 cwt. + nitrate of soda, 40 lb. in spring	39·5
Farmyard manure, 10 tons	36·6
No manure	35·7

The plots are each $\frac{1}{12}$ acre, and, since 1935 have been sown with Ghurka wheat.

The results demonstrate that under Longerenong conditions it does not pay to use fertilizers other than superphosphate. The increased yields from the various applications of this manure are shown in the following table, together with the net monetary return obtainable in each case, with wheat valued at 3s. per bushel and superphosphate at £4 3s. 7d. per ton at Longerenong. The table is a guide to the most economical dressing to use in general practice. The results indicate that, at the prices shown, an application of approximately 1 cwt. per acre is the most payable one to apply on land similar to that of the College.

TABLE VIII.—EXTRA RETURN PER ACRE DUE TO SUPERPHOSPHATE.

—	Average Yield 26 Years, 1912–37.	Increase due to Fertilizer.	Value of Increased Wheat at 3s. a Bushel.	Cost of Fertilizer* per Acre.	Extra Return per Acre due to the Manure.
	bus./ac.	bus./ac.	s. d.	s. d.	s. d.
No manure ..	34·5	..	..	..	..
Super., ½ cwt...	38·7	4·2	12 7	2 1	10 6
Super., 1 cwt...	40·2	5·7	17 1	4 2	12 11
Super., 2 cwt...	41·0	6·5	19 6	8 4	11 2

* Cost of fertilizer at Longerenong, £4 3s. 7d. per ton.

Replicated Test.—In 1933, a further series of manurial trials was introduced to compare a dressing of 1½ cwt. of superphosphate with the above applications. The plots are replicated four times and sown under the randomized block system. The average yields in the five years (1933–37) were as follow:—No manure 42·7; superphosphate ½ cwt. 44·2; superphosphate 1 cwt. 45·5; superphosphate 1½ cwt. 45·9; superphosphate 2 cwt. 45·2 bushels per acre. In this test extending over five years, the response from the fertilizer has not been so marked as that obtained during the 26-year period of the foregoing trial.

An additional treatment, to test the effect of sulphate of ammonia applied with superphosphate, has now been included in this trial. The dressing used was super. and ammonia 1–1 mixture at 2 cwt. per acre.

Zinc Sulphate.

Comprehensive tests with zinc sulphate are being conducted this season at several centres, including Longerenong. These investigations are being made following the interesting results obtained with this mineral, applied with superphosphate, on wheat crops in the Nhill district. In preliminary tests at the College last year there was a slight response from the zinc sulphate, but it was of a much lower degree than that obtained at Nhill.

The trials at Longerenong were considerably extended this season and comprise the following sections:—

1. Replicated trials with *wheat* sown with varying amounts of zinc sulphate (1 lb., 5 lb., 10 lb. and 20 lb. per acre) each applied with (*a*) superphosphate 1 cwt. per acre; (*b*) superphosphate ½ cwt. per acre; (*c*) with no superphosphate. A "no-manure" treatment is also included.

2. Observation plots—tests with zinc sulphate on miscellaneous crops (*flax, peas, subterranean clover*) and investigations with various forms of zinc.

3. Tests with zinc sulphate applied to *oats* sown on stubble land. In this trial (replicated) the mineral was applied at 10 lb. and 20 lb. per acre, with and without superphosphate (½ cwt. per acre). Control plots of "no-manure" and superphosphate ½ cwt per acre were included.

Mineral Deficiency Trials.

(WHEAT AND OATS.)

In addition to the minerals such as phosphate, nitrate, potash and calcium, which are recognized as being essential for plant growth, it has been established that certain "trace" elements, so called because they are required in minute quantities only, are also necessary for optimum plant development. An experiment was initiated this year to study this problem under local conditions and seven of these "trace" elements or minerals are being tested, on both wheat and oats, to investigate whether any of them are deficient in Longerenong soils.

Each mineral was applied in addition to superphosphate and the treatments were:—

Super. 1 cwt. + Magnesium Sulphate 30 lb. per acre.
" " + Manganese Sulphate, 30 lb. per acre.
" " + Iron Sulphate, 56 lb. per acre.
" " + Copper Sulphate, 15 lb. per acre.
" " + Borax, 15 lb. per acre.
" " + Potassium Sulphate, 1 cwt per acre.
" " + Zinc Sulphate, 20 lb. per acre.
Superphosphate only (1 cwt. per acre).

Wheat pickling Trials.

The wheat plots were replicated and sown with the Ghurka variety. The effect of these treatments on oats sown on stubble land is also being studied and in this section the superphosphate was applied at ½ cwt. per acre and the seed (Algerian) at 60 lb. per acre.

Wheat Pickling Tests.

Yield Trials.—Trials to compare the efficacy of various dry pickling treatments in the control of ball smut disease in wheat and to determine their effect on the subsequent wheat yield have been conducted since 1925. During the first nine years the treatments tested were, dry copper carbonate, formalin and bluestone, and in 1935, the new mercury dry pickling powder (Ceresan) was also included. The results have shown that all of these pickles properly applied, will effectively control the disease. The dry pickles, however have brought about rather better yields than the formalin and bluestone treatments and they also possess the advantage that the seed may be treated a considerable time before sowing without the germination being affected.

In the trial this year the two mercury powders Agrosan and Ceresan (both applied at 1½ oz. per bushel) and copper carbonate (2 oz. per bushel) are being compared with unpickled wheat as the control. The test was replicated three times and sown with Ghurka seed and 1 cwt. of superphosphate per acre.

Investigations with Various Dry Pickling Powders.—This section is devoted mainly to a comparison of the effectiveness of various brands and types of dry pickling compounds in controlling ball smut in wheat. Seven different copper powders and eleven new mercury compounds are under investigation this year. The trial includes a large number of small drill-sown plots of Dollar wheat, the seed for each plot having been artificially infected with the spores of the disease and subsequently pickled, usually at the light rate of 1 oz. per bushel. A study is also being made of the effect on the germination of the wheat of applying the powders at different quantities and at varying times before sowing.

The earlier trials showed that there were considerable differences in the efficacy of the various brands of commercial copper powders and the more recent tests have demonstrated substantial differences between the new mercury compounds. The better brands of mercury powders are much more effective in controlling ball smut than the dry copper compounds and the

TABLE IX.—PICKLING TESTS 1925–36.
Wheat Yields.

Treatment.	Average Nine Years, 1925–33.	Average Two Years, 1935–36.
	Bus./Ac.	Bus./Ac.
Ceresan, 1¼ oz. per bush. ..	..	47·7
Copper Carbonate, 2-oz. bush.	37·5	47·3
Formalin (1–450), 3 minutes	35·2	..
Bluestone, 1¼%, 3 minutes	35·0	..

fact that reduced quantities per bushel may be used somewhat offsets the higher cost of these materials. Seed pickled with mercury powders is cleaner to handle and runs more freely through the drill, but owing to the extremely poisonous nature of the mercury compounds considerable care should be taken in using them and in handling the treated seed.

Tests on Susceptibility of Wheat Varieties to Ball Smut.—In this section, 23 varieties are under test. The seed was infected with ball smut spores at a standard rate and sown, without being pickled, in small drill plots. Counts of smutted heads will be made at harvest time to determine the relative susceptibility to the disease of the different varieties.

Oat Variety Trials.

(On Stubble.)

The yield and other characteristics of various oat varieties, grown on stubble land are also under test. In the early years of this trial the oats were harvested for grain, but since 1936, the hay yields have been obtained. The plots are replicated four times and sown with 60 lb. of seed per acre, without manure. The results obtained are set out in Table X.

The varieties *Algeribee* and *Dawn*, both of which were produced at the State Research Farm, Werribee, returned a slightly higher hay yield than the standard Algerian, in the above tests. Algeribee is an improved selection of Algerian and in many trials throughout the State has proved itself superior to the parent variety in both hay and grain yields. Compared with Algerian, the new strain comes away more rapidly in the spring and usually matures a few days earlier. It is taller than Algerian and produces slightly larger heads. A limited quantity of Algeribee seed, in small lots, will be distributed from the State Farms, as supplies become available.

Table X.—Oat Variety Trials—On Stubble.

Variety.	Hay Yield, Av. 2 years, 1936–37.	Grain Yield, Av. 2 years, 1933–34.
	cwt./ac.	bus./ac.
Algeribee	14·6	..
Algerian	13·9	20·2
Lachlan	..	19·0
Dawn	14·9	16·8
Palestine	..	17·1
Mulga	14·0	16·6
Guyra	13·1	..
Belar	..	15·7
Burke	12·0	..
Gidgee	..	18·0
Burt's Early	..	17·7

Dawn also has given good hay yields in tests at several centres. This variety is a selection of Sunrise and matures a week or so earlier than Algerian. Dawn has also shown itself to be a useful oat for grazing purposes as it is very palatable to stock and produces a good bulk of feed throughout the season. So far as grain yield is concerned, Dawn has not done so well as Algerian, in tests at Longerenong.

Sowing experimental plots at Longerenong.

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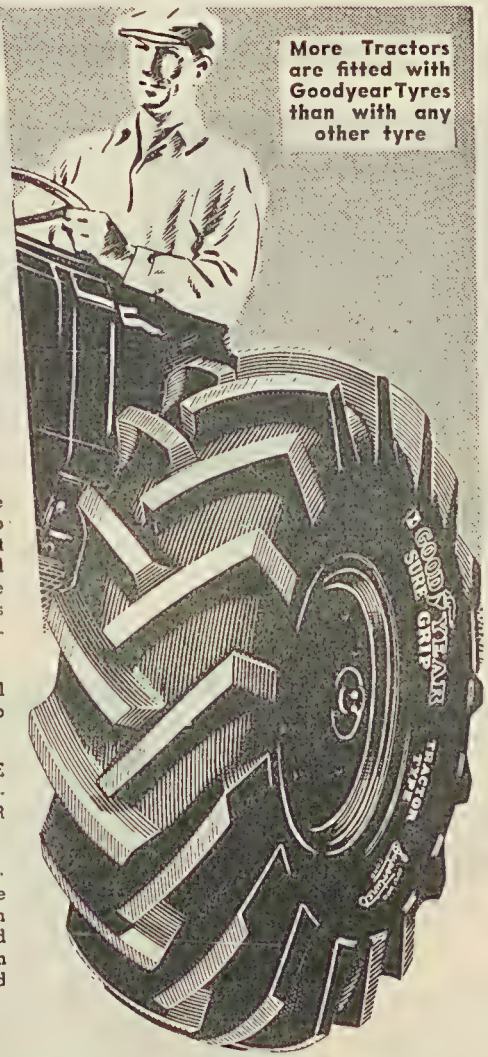

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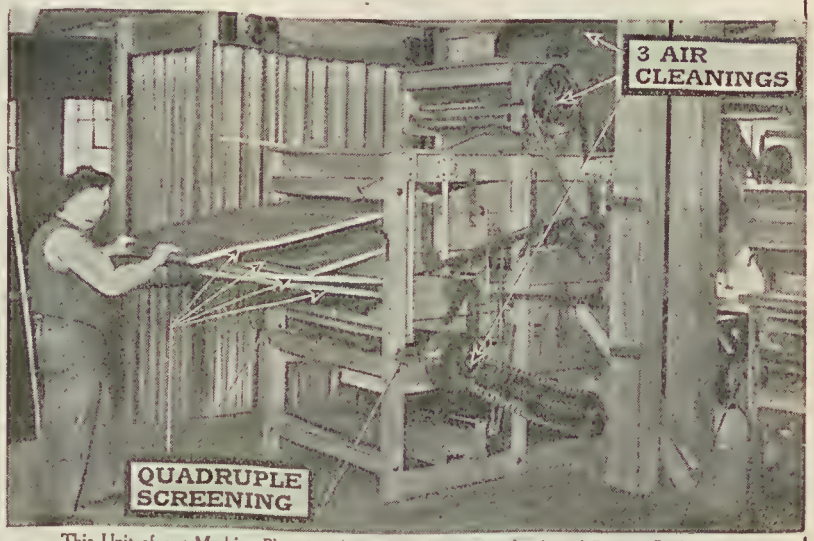

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Stud plots of crossbred wheats.

Trials with oat varieties grown on fallow have also been conducted at Longerenong in recent years. The grain yields were determined and the most prominent varieties were Burke, a late maturing oat; Palestine, a short-strawed early variety; Lachlan, Algerian, and Belar.

In regard to oat varieties recommended for the Wimmera the various tests indicate that Algerian (or Algeribee, as seed becomes available) should be the main variety for general use, also that Dawn is worthy of trial as a hay variety or for grazing purposes.

Oat Manurial Trials.

(On Stubble.)

Oat manurial trials were commenced in 1928 to determine the effect of various manures applied to oats sown on stubble ground. As shown in the Table XI., in the six-year period 1928–33, no significant increase in *grain* yield was obtained with either superphosphate or sulphate of ammonia applied separately or in combination.

The experiment was re-established in 1936 and conducted as a replicated trial with six manurial treatments of superphosphate and super. and ammonia mixtures, compared with no-manure. In this test the plots were cut for hay and the results for two years are available. In this period there was practically no increase in yield from either superphosphate or the lighter dressings of super. and ammonia mixture—a result supporting that obtained in the earlier trials. With the heavier applications of the mixed fertilizer an appreciable response occurred but not sufficient to indicate that this manure could be profitably used in general practice for stubble-sown oats on Wimmera black land. The use of super. and ammonia mixture, however, is recommended in many districts in Southern Victoria for such crops.

Table XI.—Oat Manurial Trials—On Stubble.

Grain Tests, 1928–33. (Manure Applied per Acre.)	Average Yield Six Years.
	bus./ac.
No manure	27·0
Super., ½ cwt.	27·8
Super., 1 cwt.	26·1
Ammon. Sulph., ½ cwt.	27·2
Super. and Ammonia (1–1), 1 cwt. ..	27·2

Hay Tests, 1936–37.	Average Yield Two Years.
	cwt./ac.
No manure	14·9
Super., 40 lb.	15·0
Super., 80 lb.	15·2
Super. and Ammonia (1–1), 40 lb. ..	16·0
Super. and Ammonia (1–1), 80 lb. ..	16·6
Super. and Ammonia (1–1), 120 lb. ..	19·2
Super. and Ammonia (1–2), 120 lb. ..	20·1

Seed—Algerian 60 lb./ac.

Cereal Breeding and Seed Production.

For many years all stages of wheat breeding and improvement work were undertaken at the experimental station at Longerenong, and among the most successful wheats evolved at this centre were the varieties Wannon and Nizam. Several

of the more recent crossbreds developed at Longerenong have also shown distinct promise and are at present under intensive trial in various districts. The practice now adopted by the Department is to carry out the crossing and first generation stages of cereal breeding at the State Research Farm, Werribee. The second generation crossbreds are then sown in stud rows at the various experimental stations, where selections of those plants exhibiting desirable characters are made. After a number of years of further selection, only a few of the more promising true-breeding strains of the original population are retained, These are then grown in seed multiplication plots and pass to the larger field plots for accurate testing to determine their yielding capacity and general suitability.

At Longerenong this year, the cereal breeding and development section comprises the following :—

Stud Rows.—Approximately 1000 single rows of wheat, oat and barley varieties ;

Selection Plots.—84 small test plots sown with new selections and crossbreds of both wheat and oats to study their field characteristics and comparative yielding ability ;

Seed Multiplication Plots.—61 plots of wheat and oats for seed supplies.

In the seed multiplication section a number of wheat plots is sown each year with specially selected seed, which is kept pure and true to type. By this means a continuous supply of "fresh" seed of the most improved strain available, is maintained. The produce from these plots is used to sow the College farm paddocks which, in their turn, provide the seed wheat which is distributed in large quantities to farmers throughout the Wimmera and other districts.

Permanent Rotation Tests.

Eight systems of crop rotation, with wheat as the principal crop, have been under investigation since 1918. The experiment is a permanent one and is undertaken to determine how the yield of wheat is affected when grown under various cropping systems and to furnish information on the problem of maintaining soil fertility in the Wimmera district. The details of the rotations, together with the average yields of the cereal crops since the inception of the tests, are shown in Table XII.

Some of the main features of the results of the experiments to date are as follows. In regard to the wheat crop it is notable that the highest average yields have invariably been obtained when the crop is preceded by bare fallow. Of the four rotations where this applied the three-course system *wheat-oats-fallow* produced the heaviest wheat crop, namely 37.0 bushels per acre. The effect of growing peas in the year preceding the wheat crop was to lower the subsequent wheat yield by an average of 10.8 bushels per acre, as compared with the yield after bare fallow.

TABLE XII.—PERMANENT ROTATION TESTS—YIELDS OF WHEAT, OATS, BARLEY, 1918–37.

Crop Rotation.	Average Yields bus./ac.		
	Wheat 20 yrs.	Oats. 20 yrs.	Barley 18 yrs.
Wheat continuously ..	8·9	..	..
Wheat after fallow	33·4	..	..
Wheat, pasture, fallow ..	35·9	..	..
Wheat, oats, fallow ..	37·0	20·9	..
Wheat, oats, pasture, fallow	36·3	20·8	..
Wheat, oats, peas	26·2	18·2	..
Wheat, barley, peas ..	26·0	..	25·3
Wheat, rape, barley, peas ..	27·9	..	38·2
Wheat, stubble wheat, fallow	..	..	..

NOTE.—The term "fallow" in the above table implies a typical Wimmera bare fallow

The higher yield of barley in the four-course rotation *wheat-rape-barley-peas* in comparison with the yield in the rotation *wheat-barley-peas* was due to the relative failure of the rape. This crop is usually fed-off and the residues ploughed in during November resulting in a late fallow for the succeeding barley crop. The rotation *wheat-stubble wheat-fallow* was introduced into the experiments in 1934 to demonstrate the superiority of wheat sown on fallow as against stubble-sown wheat. The average yields for the past three years were as follows :—Wheat on fallow 39.4 ; Stubble wheat 12.0 bushels per acre.

These rotation trials are not primarily directed to ascertain which is the most profitable system for the individual farmer to use. That would depend on economic and other specific factors associated with the particular farm. The tests however, demonstrate how the yield is likely to be affected when the wheat is grown under certain cropping sequences and in that connexion furnish valuable evidence for the guidance of Wimmera wheatgrowers.

A detailed examination of the seasonal yields and other factors is necessary to determine the influence of the cropping systems on the soil fertility. Such a study of the results over the

past twenty years indicates that during this period there has not been any reduction in the high level of wheat yields in those rotations more generally used in practice, such as *wheat-oats-fallow; wheat-oats-pasture-fallow.* The future results from these crop rotation trials will indicate whether such high yields can be maintained over a further extended period.

TABLE XIII.—SUMMARY OF WHEAT YIELDS, RAINFALL AND SOWING DETAILS, ON THE LONGERENONG COLLEGE FARM FOR THE YEARS 1914–1937.

Year.	Area Harvested.	Time of Sowing.	Seed Sown.	Super. Used.	Average Yield.	Rainfall (in Inches).	
						Total.	1st June to 30th Nov.
	acres.		lb./ac.	lb./ac.	bush. per acre.		
1914 ..	100	14 May to 30 June ..	60 to 63	70	6	12·19	4½
1915 ..	274	20 May to 31 July ..	50, 60, 90	70	28	16·55	13
1916 ..	361	2 June to 18 August ..	75 to 90	112	34	21·00	17½
1917 ..	305	23 May to 30 June ..	60 to 90	100	39½	16·79	10½
1918 ..	342	5 May to 17 July ..	74 to 84	84 to 112	36	14·75	8
1919 ..	242	26 May to 17 July ..	75 to 85	110 to 112	27	11·48	4½
1920 ..	266	20 May to 14 July ..	80 to 90	90 to 112	38	15·09	11
1921 ..	320	4 June to 8 July ..	85 to 90	112	42	17·66	8½
1922 ..	383	10 June to 20 July ..	85 to 90	112	30	16·28	9½
1923 ..	371	11 June to 10 July ..	85 to 90	140	47½	15·60	11
1924 ..	349	14 June to 19 July ..	85 to 90	132 to 180	41	18·10	12½
1925 ..	444	24 June to 10 July ..	85 to 90	150	36	11·28	6½
1926 ..	420	3 June to 2 July ..	84	140	39½	14·92	8½
1927 ..	339	21 June to 12 July ..	84	150	24½	10·18	6½
1928 ..	441	14 June to 5 July ..	80 to 84	150	17½	16·11	7½
1929 ..	479	11 June to 5 July ..	80 to 84	150	17½	13·74	5½
1930 ..	442	7 July to 22 July ..	82	150	26	17·43	9½
1931 ..	539	27 May to 15 July ..	75	140	35½	16·33	9½
1932 ..	517	7 June to 2 July ..	75	140	45	15·73	7½
1933 ..	423	22 May to 7 June ..	78 to 84	140	38	19·05	8½
1934 ..	637	26 June to 19 July ..	80 to 82	140	37½	15·33	12½
1935 ..	395	17 June to 1 July ..	79 to 82	140	39	14·61	9½
1936 ..	435	16 June to 2 July ..	80 to 84	140	41	20·29	10½
1937 ..	434	28 June to 16 July ..	77 to 80	140	44½	16·94	7½

Christmas Air Mails for the United Kingdom and Europe

THE Deputy Director Posts and Telegraphs advises that the Air Mail closing at the Elizabeth-street Post Office and the General Post Office, Spencer-street, Melbourne, at 6 a.m. on Tuesday, 13th December, 1938, is due in London on the 23rd December. This mail affords a final opportunity for those desirous of sending small packets (not over 2 lb.) and greetings to relatives and friends in the United Kingdom and Europe for delivery before Christmas Day. The reduced air mail fees are applicable to Christmas mail for the United Kingdom as well as other Empire Countries. All Post Office officials will be pleased to furnish information regarding the fees payable.

Small packets for Overseas must always be handed in at a Post Office counter, and must bear a Customs label which is obtainable at any Post Office.

Clean Milk Competition

Dandenong District

Report of the Judges, R. T. McKenzie, Senior Dairy Supervisor, and O. Bence, Dairy Supervisor.

IN an endeavour to further improve the conditions under which milk is supplied to the consumer, a Clean Milk Competition was conducted under the auspices of the Dandenong Agricultural Society and judged by Officers of the Department of Agriculture. It has just been completed. While it is recognized that there has been considerable improvement in milk supply during the last few years, there is still room for further progress. The dairy farmer is often resentful of the criticism of his so-called dirty milk. He looks around and sees his own children reared on it looking the picture of health, and fails to uderstand why it should have any harmful effect on others. He does not always comprehend the fundamental biological changes that take place in milk from the time it is produced until it is consumed by the city child whose environment is so much different from his own.

Showing the brick dairy and wash room of Mr. H. Wanke, winner of the over-25 cow section.

These competitions, because of their educational effect, are being fostered by those interested in a cleaner milk, who believe that reform will be accomplished more by education than by coercion. The object, therefore, is to demonstrate, in a friendly way, that it is quite within the province of all dairy farmers, no matter how humble the dairy buildings, to produce a clean, sanitary milk. Although a reasonable standard of buildings and equipment is required, the chief factors are the elementary details of cleanliness, viz. :— clean healthy cows, washed udders, clean and dry hands, and above all, sterile utensils. No matter how grandiose the buildings, unless these simple precautions are followed, the results are ineffective. Many striking instances of this fact were observed during the recent competition.

The Competition was divided into two sections, one for those milking 25 cows or more, and one for those milking less than 25. It was realized, that the larger the number of cows the more difficult it was to superintend the details of cleanliness and all that term connotes. The scale of judging points included the health of cows, recognition being given for tuberculin testing and freedom from mastitis, equipment and dairy practice, sediment tests and bacterial contamination. It is pleasing to report that judging milk by these criteria, that is, its freedom from visible dirt and bacterial content, all the competitors reached a high standard. Approximately 80 per cent. of the entrants have their cows tuberculin tested annually at their own expense. During the twelve months of the competition each farm was visited by the judges four times. From the outset keen interest was shown by all the competitors. They were eager to avail themselves of any suggestions that would improve dairy practice and sanitation. Generally speaking meticulous care was exercised in every operation of milking and treatment.

The Awards.

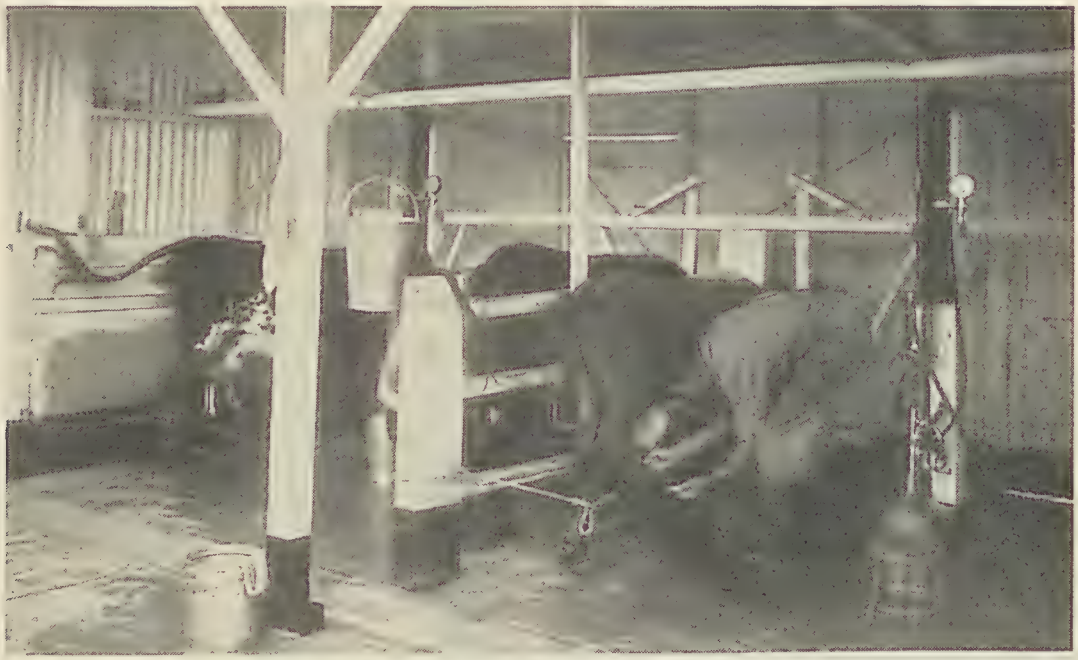
In winning the first prize in the section for 25 cows or more with a score of 1,425 points out of a possible 1,500, Mr. H. Wanke, of Narre Warren, put up a striking performance considering the large number of cows milked. The dairy and wash room are of brick under a gable roof with an overhang of 18 inches. The dividing wall gives each room an inside measurement of 12-ft. x 14-ft. and the walls are cement rendered with a glass like finish. The floors are concrete and well-drained, the windows are hoppered, of the intake ventilation type and flyproof. A loading door and platform make loading of milk an easy matter. The draining racks in the wash room consist of 2-in. galvanized iron water piping bracketed to the wall. Steam under pressure is used for sterilizing utensils, the boiler being housed in a recess adjoining the washroom with steam pipes leading through the walls. A noteworthy feature was that all cans, buckets, cooler, &c., were well tinned and of the seamless variety.

The cowshed has a lofty gable roof with weatherboard walls. The floor is impervious, well-graded and drained. Fifty cows are bailed at a time. The interior of the shed is painted white, with a dado treated with a non-odorous bitumen paint, which is washable. The lane leading to the yard is metalled, the yard itself stone paved with concrete approaches to the shed. Warm water and clean towels are provided at the shed to wash and dry milkers hands and cleanse udders. The legropes and milking stools are scrubbed daily. It is interesting to note that Mr. H. Wanke is a descendant of an old pioneer family of Narre Warren. His grandfather selected this property about 100 years ago.

The second prize in this section was divided between Messrs. T. L. Keys, of Keysborough, and A J. Hamilton, of Dandenong, each of whom scored 1,405 points. Mr. Keys had 60 cows milking and depended entirely on hired labour for assistance. Keen interest was taken by the family in maintaining an excellent standard of sanitation. Their efforts in clean milking methods were awarded by Mr. Keys obtaining the most marks for the wad tests. Mr. Keys' dairy is a modern brick combination structure, a partition wall dividing the dairy and wash room, each room measuring 12-ft. x 14-ft. The gable roof has a good overhang and is well ventilated. The walls are cement rendered, ceiling coved, doors and windows flyproof and the concrete floor is well graded and drained. Large can racks of galvanized iron water piping provide ample drainage for the utensils. A large pressure boiler is installed for sterilizing utensils and supplying warm water for washing cows' udders and teats. The interiors of the dairy and wash room are coloured white with black dado. The cowshed is a gable roof structure with galvanized iron walls. The floor is of grouted brick, and is well graded and drained.

Mr. A. J. Hamilton is to be commended on gaining equal second place. Prior to the competition he was not satisfied with structural conditions. New dairy buildings were erected and a mechanical milking plant installed. The new dairy and wash combination of brick is of standard size, is well ventilated, flyproof doors and windows are provided while the concrete floor is well graded and drained. The interior colour scheme is white with plum coloured dado. Steam under pressure is used for sterilization of utensils and milking machine parts. The cowshed is the semi-enclosed type with gable iron roof

Mr. A. J. Hamilton's premises.



A feature on the farm of Mr. F. Williams, winner of the section for herds of less than 25 cows, is the daily testing for abnormalities of the fore-milk from each cow.

and iron walls, the floor is concreted, graded and drained, and a good supply of water is provided at the shed for washing cows' udders and teats, also for flushing down floors and drains.

The third prize was awarded to Mr. G. Trewin, of Cranbourne-road, Dandenong, with a score of 1,385 points. Mr. Trewin has been most consistent and the general standard of sanitation was excellent. The dairy buildings face the east, and the open type cowshed, constructed of galvanized iron, has a good concrete floor and is well graded and drained. Ample sunshine and fresh air circulate through the shed, and that "cowy" smell, which is so common in the closed type of shed, is entirely absent here.

The special prize for the most improved competitor was awarded to Mr. W. J. Whitford, of Dingley, with a score of 1,375 points. The Whitford family have effected many improvements during the competition. A large portion of the cowshed has been reconstructed and a new concrete floor, with necessary drainage provided. The cow yard is being bricked and in the near future cow yard mud will be entirely eliminated.

In the section for herds of less than 25 cows, the first prize was awarded to Mr. F. Williams, of Frankston-road, Dandenong, with a score of 1,430 points. Mr. Williams was fortunate in having such an able assistant as Mr. A. Booker, who was in charge of the premises during the competition. Twenty cows are milked on this farm and a two-unit bucket plant is in use. The dairy and wash room are separate buildings, constructed of fibro-cement with galvanized iron gable roof. The ceilings are coved and internal linings consist of plain galvanized iron. A brick base with floor vents keeps the floors sweet and dry. The dairy buildings are well ventilated and flyproof, and the floors of concrete are well graded and drained. The colour scheme used for the interior is white walls with a black dado one foot high.

The utensils are well tinned and in excellent order, seamless buckets and cans are used, and a low pressure heater provides ample boiling water and steam for sterilization of utensils. Hot water is available for washing cows' udders and teats. The cowshed is the walk-through type consisting of gable iron roof and iron walls, the floor is concreted, graded and drained, and the small holding yard is bricked, and the approaches at releasing doors are concreted. A special feature on this farm has been the care taken in the daily examination of the fore-milk from each cow. A billy lid painted black is used to examine the milk for any abnormalities. Other features are the chain leg-ropes and steel milking stools. The concrete drain from the shed carries the floor washing, liquid manure, &c., to a large pit from

where it is pumped into a tank and spread over the pastures. This is one way of making use of the liquid manure that otherwise would be wasted. When Mr. Williams first purchased this 40-acre farm, it would carry only one cow to four acres. Annual top-dressing and subdivision for rotational grazing have improved the carrying capacity to two acres to the cow.

The second prize in this section went to Mr. T. H. Owen, of Lyndhurst, with a score of 1,420 points. Mr. Owen takes a pride in his farm and the neat hedges surrounding the residence, and general well kept appearance of buildings, &c., suggest sound farming practice. The weatherboard dairy is lined throughout with plain galvanized iron, flyproof doors and windows are provided, and a concrete base and floor give the building a neat appearance. The colour scheme of the interior of the dairy is white with black dado. The wash room is the skillion lean-to type with concrete floor and drainage. A steam boiler is used for sterilization of utensils. Seamless buckets and cans are used and all utensils are in excellent repair. The cowshed is a semi-enclosed type with good concrete floor, approaches and drainage. A dust-proof partition divides the feed room from the milking shed. The dairy is situated rather far away for convenient working, but any disadvantage is offset by the scrupulous cleanliness of utensils and the general tidiness of the premises.

Dairy buildings on the farm of Mr. T. H. Owen, who gained second place in the small herd section.

The judges were unable to separate Mr. F. G. Wall, of Mordialloc, and Mr. H. Wells, of Chelsea, for third place. Both competitors scored 1,400 points. While Mr. H. Wells has a modern brick dairy and wash combination, with new cow shed, concrete floors and excellent drainage, Mr. Wall was able to offset any disadvantage in buildings by excellent dairy equipment and a splendid

Mr. G. Trewin's open type cowshed. Ample sunshine and fresh air circulate through this shed.

grouted brick holding yard for the herd. The neatness of the dairy buildings, yards, fencing, &c., show sound methods in farm management. Miss Wall deserves great credit for the help she has given her father.

The special prize for the most improved competitor in the "less than 25 cow" section was awarded to Mr. G. V. Parry, of Boundary-road, Heatherton, with a score of 1,395 points. On this small farm, Mr. Parry milks fourteen cows and has maintained a ten-quart average per cow. The neat brick dairy and wash combination, excellent equipment, cleanliness of cowshed, yards, milking stools and legropes, reflect credit on this competitor.

The competition was concluded by a field day held on Mr. Williams' property, where about 150 interested farmers attended. Lectures were given by the Superintendent of Dairying (Mr. J. M. Kerr) on dairy sanitation; Mr. Sjogren, B.V.Sc., on stock ailments; and Mr. L. C. Bartels, B.Agr. Sc., on pasture improvement. Later in the day some of the winning farms were inspected.

Butter Production and Export

The following table shows:—

(*a*) Factory production of butter and cheese in Victoria for the period July to September, 1938, compared with the corresponding period of 1937.

(*b*) Quantities and percentages of various grades of bulk butter examined in Victoria for export during the period July to October, 1938, in comparison with the corresponding period of 1937.

FACTORY PRODUCTION OF BUTTER AND CHEESE IN VICTORIA (QUANTITIES IN TONS).

Month.	Butter.		Cheese.	
	1938.	1937.	1938.	1937.
July	2,165	2,336	289	259
August	3,502 (*)	3,557	439 (*)	394
September	5,626 (*)	5,999	863 (*)	719
Totals—3 Months	11,293*	11,892	1,591*	1,372

* Subject to revision.

BULK BUTTER EXAMINED IN VICTORIA FOR EXPORT (QUANTITIES IN TONS).

Month.	1938. How Graded—				Total.	Month.	1937. How Graded—				Total.
	Ch.	1st.	2nd.	Pty.			Ch.	1st.	2nd.	Pty.	
July to September	2,878	702	187	9	3,776	July to September	2,131	593	179	8	2,911
October ..	3,728	802	166	10	4,706	October ..	5,455	1,164	223	9	6,851
Totals—4 Months ..	6,606	1,504	353	19	8,482	Totals—4 Months..	7,586	1,757	402	17	9,762
Percentages ..	77·9	17·7	4·2	0·2	..	Percentages ..	77·7	18·0	4·1	0·2	..

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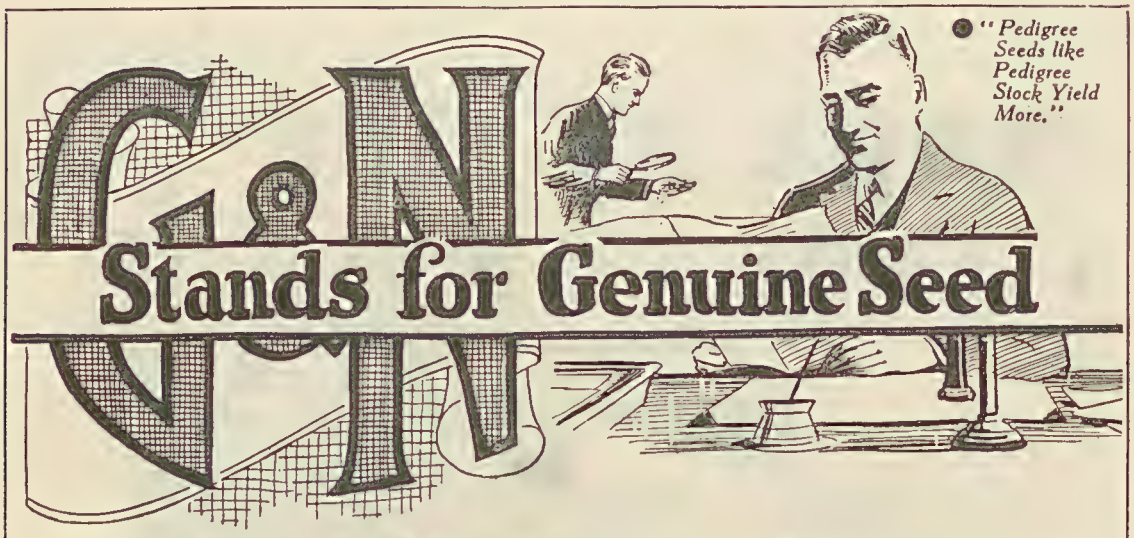

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A northern irrigation channel.

Irrigated Pastures

Probable Effects of the Adverse Season

By E. T. Beruldsen B.Sc. (Agric.), Senior Irrigation Officer, Department of Agriculture.

COMPARED with the farmers and graziers outside the irrigation areas, those who have a supply of irrigation water, however limited, are singularly fortunate in a season like the present. But since in the past it has been the practice generally to stock up to the limit of the capacity of each holding, irrigation farmers are going to be faced with very serious problems if present storages prove inadequate to keep up the supply of water beyond the month of February. However, such an adverse season will prove of immense value if it serves to emphasize the need for better methods of grading, with consequent better distribution and more economical use of the irrigation water, for more liberal use of superphosphate, for judicious stocking and grazing of the pastures, and last, but not least, for adequate fodder conservation.

Towards the end of last irrigation season, when some restriction was placed on water supply in certain districts, one could not fail to notice how much more careful individual farmers were in applying the water and avoiding waste. Indeed, in one district, the almost criminal waste of 20 acre-feet of water per day escaping in the main drainage channel dropped to 5 acre-feet almost immediately. With even the best methods of irrigation practice it is almost impossible to avoid some wastage, but to irrigate efficiently one must have proper control of the water, and this can be done only when paddocks are properly laid out and supply channels are kept clean and free from obstructions. The irrigator must be vigilant, and casual attention to the irrigation must cease. Over watering and bad distribution bring many evils, especially in districts where "salt" is known to exist. Circumstances such as exist during the present season impress those concerned with the real value of irrigation water. It is almost an adage that people appreciate a commodity most when either it costs them a lot, or when they cannot obtain it easily. In the seasons when irrigation water has been plentiful, it has been quite obvious that, speaking generally, the relative efficiency of the irrigation farmers in using water in

various districts has been correlated with the relative cost of that water.

Apart from even distribution and the avoidance of waste through drainage, the question of better penetration is of paramount importance in most irrigation areas. A great number of light waterings is definitely uneconomical, and it is this general practice which has led to the statement often expressed that "pastures take more water than lucerne." While waterings in excess of 4 inches are wasteful, it should be the aim of the irrigationist to approach this amount at a watering over as much of his pasture as possible. In the majority of cases, this amount is not absorbed in the first application, but can be supplemented by a subsequent application on the following day while the ground is still moist. Under this system there is less waste through evaporation and the better penetration allows a longer period between irrigations. It has been proved that this method will result in a saving of inches of water in the course of a season, and compared with the other more common method will give no less production from the pastures.

The importance of liberal manuring with superphosphate in affecting an economy of available moisture is not appreciated generally, Although most irrigation farmers realize that if they induce prolific growth through regular waterings it is necessary to use superphosphate liberally to replace the phosphoric acid withdrawn from the soil, it would be extremely fallacious to deduce that if water supply is restricted the dressings of superphosphate in general use should be curtailed. In carefully controlled experiments it has been shown that within certain limits an additional 2 cwt. of superphosphate in excess of a basil dressing of 2 cwt. could offset any loss in production which might have occurred if the total irrigation for the season had been curtailed by 6 inches. Superphosphate induces pasture plants to make best use of what moisture is available.

Another factor which contributes to the saving of applied moisture is judicious grazing of the pastures. Too often one notices irrigated pastures which have been grazed almost to the roots of the plants. All cover for the surface soil is removed, and the subsequent drying out of the surface soil is noticeably rapid. This effect is accentuated in soil types which tend to crack on drying out, since the cracking accelerates the rate of evaporation of the moisture. The maintenance of sufficient cover builds up the sward, permits the accumulation of organic matter, and consequently reduces the amount of surface cracking in those soil types to an absolute minimum. Apart from the saving of moisture, pasture which is grazed uniformly, but not too severely, at regular intervals of about one month will give a much higher production of a well-balanced

Unless a paddock is well graded, satisfactory distribution and the most economical use of irrigation water cannot be expected.

fodder in respect of botanical and chemical composition than pasture which is grazed too short and too frequently. A natural corollary of judicious grazing is the balanced diet for stock, and a balanced diet will minimize the incidence of disease.

Although irrigation farmers, and particularly dairy farmers, compare favorably with the graziers in the dry areas in the matter of fodder conservation, there are too few who, besides making provision for supplementing the pasture in the winter months also insure against an adverse season with restricted water supply. A possible shortage in the summer is never considered seriously in the irrigation areas. Such a shortage in the summer presents a problem rather different from the usual winter scarcity of pasturage. Succulent feed may be entirely absent for a prolonged period. The usual type of conserved fodder in irrigation areas is lucerne or meadow hay. While this is an excellent fodder, it has the disadvantage of being dry and non-succulent. Hence the attention of irrigation farmers is directed to the possibilities of silage which can be kept in a pit or stack for years without any danger of detrioration or of being destroyed by fire, and provided a suitable site is chosen for the pit or stack, there should be no risk of flood damage. Numerous types of herbage can be added to the silo, and pasture clippings from paddocks which tend to become patchy, rank, or tussocky can make a very valuable contribution to the pit or stack. The clipping of grazed pastures at such times will induce a more uniform growth, and freshen the pasture sward generally.

Recently, on a fairly large property which had only a part water right, a wonderful development of Wimmera rye-grass and subterranean clover was noted extending over a fairly wide area. The cereal crops on part of the remainder of the property were almost a complete failure from the hay-cutting view-point. Nevertheless, the pasture was being grazed while it was intended to water the crop with the small amount of water still available. The stock were unable to cope with the wealth of growth on the pasture, and it appeared that it would be a better proposition if the stock were transferred to the cereal crop, and that another watering should be given to the pasture, and that this should be cut for hay eventually. It was indicated that a higher yield of a better quality hay might be expected if this were done. This illustrates the necessity at such times to consider what is the best use to which a limited supply of water may be applied.

In conclusion, there is one possible effect of a shortage of irrigation water for mixed pastures which may provide some small consolation to irrigation farmers who are faced with this difficulty. While it has been regarded generally that if water is withheld for a prolonged period from species such as perennial rye-grass, cocksfoot, and white clover, the pasture will be lost, it is safe to assert that such pastures have demonstrated in the past unexpected powers of resistance to drought conditions. In each species there is a conglomeration of strains, and under harsh conditions it is the poorer types or strains which suffer most and which may die out. Generally, the more robust and vigorous strains survive, and when good conditions again supervene these robust strains become aggressive, and gradually replace the poorer types of pasture plants in the sward. This is true particularly of white and strawberry clovers.

By this process of natural selection the pasture becomes populated eventually with the more persistent robust type of pasture plants, and may become even more productive than it was before suffering the severe check. It must be remembered, however, that this applies to pasture which has been established for some time, and which has been afforded good treatment with regard to superphosphate. In experimental plots at Werribee, the liberally top-dressed plots which have received spring and autumn waterings only during the past five years have a sward which is dominantly cocksfoot, superior strains of white and strawberry clovers, and, to a lesser degree, perennial rye-grass. Annual species of grasses and subterranean clover which might have been expected to take possession in the circumstances are not much in evidence, while they predominate together with a variety of weeds on the plots which have been inadequately manured, or which have received no manure whatever.

London Markets

Weekly Prices

The following information as to prices offering in London for the principal Victorian primary products has been taken from cablegrams received each week by the Department of Agriculture from the Victorian Agent-General in London.

Product.	Price for Week Ending—			
	4th Nov.	11th Nov.	18th Nov.	25th Nov.
	d.	*d.*	*d.*	*d.*
Lamb, 1st quality, Victorian .. .. 29–36 lb. ..	..	..	..	..
Lamb, 1st quality, Victorian .. .. 37–42 lb. ..	..	..	..	..
Lamb, 1st quality, other States .. .. 29–36 lb. ..	7½	7⅝	7⅝	7¾
Lamb, 1st quality, other States .. .. 37–42 lb. ..	7¼	7¼	7¼	7¼
Lamb, 2nd quality, Victorian .. .. 28 lb. and under	..	..	..	..
Lamb, 2nd quality, Victorian .. .. 29–36 lb. ..	..	..	..	..
Lamb, 2nd quality, other States .. .. 28 lb. and under	7	7	7	7
Lamb, 2nd quality, other States .. .. 29–36 lb. ..	6⅝	6½	6½	6½
Lamb, 3rd quality, all States .. .. 28 lb. and under	6½	6½	6½	6½
Lamb, 3rd quality, all States .. .. 29 lb. and over	6¼	6¼	6¼	6¼
Mutton wethers and/or maiden ewes .. Under 40 lb. ..	3¾	3¾	3¾	3⅝
Mutton wethers and/or maiden ewes .. 41–48 lb. ..	3⅝	3⅝	3⅝	3½
Mutton wethers and/or maiden ewes .. 49–56 lb. ..	..	..	..	..
Mutton ewes .. .. Under 40 lb. ..	3¼	3⅜	3⅜	3½
Mutton ewes .. .. 41–48 lb. ..	..	..	..	..
Beef, frozen ox hinds .. .. .. 145–210 lb. ..	4¼	4¼	4¼	4¼
Beef, frozen ox crops, weights corresponding	3½	3½	3⅝	3⅝
Beef, chilled ox hinds .. .. .. 145–210 lb. ..	5¾	5¾	5¾	5⅝
Beef, chilled ox crops, weights corresponding	4	3⅝	3½	3⅝
Pork, Australian 1st quality .. .. 60–80 lb. ..	7⅛	7⅛	7¼	7⅜
Pork, Australian 1st quality .. .. 81–100 lb. ..	7	7	7	7
Pork, New Zealand, 1st quality .. .. 60–80 lb. ..	7⅛	7⅛	7¼	7⅜
Pork, New Zealand, 1st quality .. .. 81–100 lb. ..	7	7	7	7
	s.	*s.*	*s.*	*s.*
Bacon, Canadian .. .. .. per cwt. ..	85	80	77	77
Bacon, Empire (cured in England) .. .. per cwt. ..	83	80	77	77
Bacon, Danish .. .. per cwt. ..	95	90	86	87
Butter, unsalted, choicest grade .. .. per cwt. ..	110–111	106	104	102
Butter, unsalted, 1st grade .. .. per cwt. ..	108–109	104	101	100
Butter, unsalted, 2nd grade .. .. per cwt. ..	..	..	..	..
Butter, unsalted, pastry grade .. .. per cwt. ..	..	..	..	..
Butter, salted, choicest grade .. .. per cwt. ..	109–110	104–105	100	101
Butter, salted, 1st grade .. .. .. per cwt. ..	108–109	102–104	99	100
Butter, salted, 2nd grade .. .. .. per cwt. ..	107	100–102	87	88
Butter, salted, pastry grade .. .. per cwt. ..	103	98–99	94	94
Butter, Danish .. .. per cwt. ..	133	133	134	142
Market (butter)	Slow	Steady at the end of week.	Improved demand at end of week.	Steady

Undera Pasture Competition

Report of the Judges—Messrs. J. Bullingham, Tongala; and E. T. Beruldsen, B.Sc.Agr., Senior Irrigation Officer.

THE inaugural irrigated pasture competition conducted by the Undera Herd Testing Association attracted eight exhibits of considerable merit. The exhibitors were scattered over a very wide area, and it is to be hoped that in future competitions more entries will be received in the Undera district itself.

As the organizers of this competition were not familiar with the conditions of similar competitions which are conducted on other irrigation districts, it appears opportune to make some suggestions as to possible regulations for future competitions. In the first instance, pastures entered in such competitions should be appraised twice during the season. A spring inspection is insufficient indication of the true value of a pasture. With the normal spring growth of annual species dominating the perennials and obscuring small blemishes caused by inferior grading, to some extent, there is a tendency to overestimate the pasture's worth. The real test of an irrigated pasture and of the methods employed by an irrigation farmer is an inspection later on in the summer, when the annual species will have died. Only good watering methods associated with good lay-out, and liberal manuring practice will ensure a persistently high production from, and an attractive appearance of, the pasture in the month of February, for example.

The allotment of points in the competition, as can be noted in the accompanying award, makes it apparent that the best sward of pasture need not necessarily win such a competition. Such an allotment of points is fair since it ensures that no competitor has the advantage through fortuitous circumstances such as exceptionally good land, or through having established a pasture some years prior to another competitor. There is no doubt that a pasture, if well looked after, will accumulate fertility and improve with age. A premium must be paid to good cultural practices.

The minimum area of ten acres stipulated in this competition is subject to criticism since, in small irrigated farms, it is only rarely that one finds a paddock large enough to comprise the whole exhibit. The judges' task was somewhat complicated in certain cases to appraise three paddocks as one exhibit. In most competitions of this type a minimum area of three acres is stipulated.

The stipulation of a maximum area is also a good idea, since it does not impose a penalty on those competitors with large areas. A good maximum area for purposes of judging is ten acres.

It would be a progressive move if a separate class for irrigated pastures composed of annuals were included in future competitions. In the Undera district there are a number of larger properties with only part water rights, and properly appreciating the fact that lucerne or annual pastures are best suited to these conditions, quite a number of farmers were debarred by the conditions of this competition from exhibiting fine examples of the annual type pasture. It is felt that the inclusion of such a class, and possibly one for lucerne, would stimulate local interest, and the allocation of prizes could be altered accordingly to meet the new conditions. A further contribution to the stimulation of local interest would be the institution of small species plots at the various schools. Such plots in other irrigation areas have proved very valuable, not only as an educational project for the children, but as a source of knowledge of the relative merits of numerous pasture plants to surrounding irrigation farmers.

In the Undera district the establishment of pastures of perennial species is mostly a new departure, and it was gratifying to find that all the competitors fully appreciated the significance of strain in pasture plants, and had made certain that they procured certified seed in the first instance. The value of irrigation wild white clover was fully appreciated, and on Mr. Esler's property at Wyuna South, its value was amply demonstrated. On this property the pastures had been sown a considerable number of years ago, and the white Dutch clover originally sown had been entirely superseded by the robust and highly productive wild white clover. Although Mr. Esler has been using superphosphate consistently in small amounts for years, it was during the last three years when more liberal dressings were applied that the development of the wild white clover became most marked.

Mr. W. L. Armstrong, of Undera, is an enthusiastic supporter of improved pastures, and on his property of 320 acres, through the judicious apportioning and application of a limited water supply, he has found it possible to carry through the season 57 head of dairy cattle, 17 horses and 180 lambing ewes. Some 58 acres was under crop. The irrigated area comprises 30 acres of perennial type pasture, 80 acres of the annual type with subterranean clover, and 30 acres of lucerne. Where the water supply is restricted, such an apportioning of the irrigable area does not place an undue strain on the supply. In an adverse season such as this, water may be withheld from the lucerne and subterranean clover with safety and be reserved for the pastures of perennial species. Even the latter pasture type has demonstrated its capability of withstanding fairly long dry periods.

At the Research Farm at Werribee, pasture plots which had been established for some years had various watering treatments imposed on them. The plots liberally top-dressed with superphosphate, and which were watered "spring and autumn" only during the last four seasons retained the cocksfoot, perennial rye-grass, and white and strawberry clovers; while in those plots which were manured lightly or had no manure, the sward has reverted to inferior annual grasses or native perennials associated with annual weeds and subterranean clover. There is strong evidence to show that the result of the harsh watering treatment has been to eliminate the poorer strains of white clover and leave the more persistent and robust strains, which, when good conditions supervene, become aggressive and largely recover the ground lost through the disappearance of the poorer strains. There is no doubt that it is by some such process of natural selection that the famous irrigation white clover has evolved. This adverse season, with the possibility of water supply proving inadequate to carry through to the autumn, will have served a useful purpose if it focusses attention on good methods of lay-out in order to save water, the advantages of liberal manuring with superphosphate, judicious grazing and adequate fodder conservation.

Several cases were noted in this competition where check-banks were either entirely absent or too infrequent. Apart from obviating waste through excessive drainage, a proper lay-out will ensure control of the water, an even distribution on the land, and the avoidance of the evils associated with watering areas to excess. Liberal manuring with superphosphate does effect an economy in the use of irrigation water through inducing the pasture plant to make better use of what moisture is available. Judicious grazing at intervals of approximately one month, apart from resulting in a higher production from the pasture than if it were grazed at much shorter intervals, will ensure that an adequate cover of the surface soil will minimize cracking and free evaporation of moisture.

Too often irrigation farms are stocked up to the limit of their capacity, and apart from making provision for the normal winter storage of pasturage, little thought is given to the posibility of a summer shortage. While hay is the normal medium of fodder conservation to supplement winter pasturage, it appears that more attention should be given to the possibilities of ensiling succulent green fodder in periods of prolific growth, to supplement the supply of green fodder when summer shortage occurs. Silage either in the pit or stack will keep indefinitely without deterioration if properly made, and pasture clippings lend themselves admirably as a contribution to the silo. A pasture reserved for silage can be cut at a relatively immature stage, and less deterioration of the sward as a grazing medium occurs than when the pasture is reserved as hay.

The Awards.

Mr. P. E. Wade of Lancaster gained first place with three areas of pasture comprising in all just over ten acres. One section was sown down seven years ago on fallow with the following mixture per acre:—Hawke's Bay perennial rye-grass 20 lb., cocksfoot 2 lb., white Dutch clover 4 lb., wild white 2 lb., cow grass 2 lb., and lucerne 2 lb. This area has developed into a first class sward with a very good mixture and was in excellent condition at the time of inspection. Few weeds were noted. The pasture had been manured at the rate of one bag per acre per annum during the first five years, but this dressing had been increased to 2½ bags during the last two seasons. As a result of this good treatment one area of 2½ acres which had been originally sown with lucerne only, and which had become infested with rushes when the lucerne thinned out, had now developed into a self-sown pasture with rye-grass, cocksfoot, paspalum and white clover, and the rushes had almost disappeared.

An area of three acres which had been sown only last year had a good representation of all the species, but the wonderful development of cow grass demonstrated the value of this species in providing a bulk of growth during the early

Portion of dairy herd on Mr. A. Forryan's pasture.

period of establishment of a pasture while other species such as white clover are developing more slowly.

The pastures generally are watered at fairly short intervals. If the system of supplementary watering were carried out, an economy in the use of water would result and the pasture would be able to hold out for longer periods as a result of better penetration. This supplementary watering is achieved by going over the same ground with a smaller stream of water one or two days after the initial application.

Four years ago Mr. Wade had only 6½ acres of pasture established and this area kept fourteen cows continuously for nine months. Now that more paddocks are available an endeavour is made to give each paddock in turn a rest of three weeks. Thirty cows are being carried on the property.

Second place in the competition was awarded to Mr. A. Forryan of Wyuna, who also exhibited three separate paddocks to make up the required area. Mr. Forryan's block of 65 acres has a water-right of only one in four, and as he has highly developed his farm for irrigation he is in the unfortunate position this year of having an inadequate supply of water to maintain his pastures and lucerne in good growing condition.

The main section of four acres had been established in the autumn of 1934, and a remarkably good sward of pasture in good growing condition was in evidence, the dominant species being perennial rye-grass and wild white clover. Cocksfoot was becoming more plentiful and there was a fair representation of *Paspalum dilatatum*, particularly in a few patches where water tended to lie. The original mixture sown was 10 lb. certified Hawke's Bay perennial rye-grass, 4 lb. cocksfoot, 2 lb. Paspalum, 1½ lb. certified New Zealand wild white clover, and ½ lb. subterranean clover. The pasture had been top-dressed each year with 1½ bags of superphosphate per acre.

The second area of pasture had been surface sown on the site of an old lucerne stand which had been scarified three times before introducing the pasture seeds in June of this year. Here 2½ lb. of Dingee certified wild white clover had been sown in addition to the rye-grass and cocksfoot, and to encourage a bulk of growth during the early stages 2 lb. of cowgrass had been included. The old lucerne plants also contributed to the excellent bulk of growth which was noted on the day of inspection, the pasture having reached almost meadow stage. This pasture demonstrated the possibility of successfully establishing good pasture on a thinned out lucerne stand when the paddock is well graded, and without the necessity for regrading or reploughing. The development of the Dingee wild white clover even at this early stage was very satisfactory.

At the end of July this year a further small area had been sown with 5 lb. of Hawke's Bay perennial rye-grass, 5 lb. of cocksfoot, 4 lb. of

UNDERA PASTURE COMPETITION, 19TH TO 20TH OCTOBER, 1938.
Details of Award.

Exhibitor.	Lay-out for irrigation and condition of channels.	Condition of pasture.	Uniformity.	Mixture.	Freedom from weeds.	Total.
Possible Points	20	20	20	20	20	100
P. E. Wade	18	19	16½	18	16½	88
A. Forryan	18	18	16	18	17	87
C. N. Bidstrup	16½	17½	16½	18½	16	85
Mrs. R. C. Dickson	17	18½	16	16½	15½	83½
S. Esler (No. 1)	17	17	16	17½	15½	83
W. L. Armstrong	15½	17	16½	17	16½	82½
R. L. Glover	16	18½	15	16	16	82
S. Esler (No. 2)	14	18	16½	16½	15	80

Paspalum, the unusually large seeding of 7 lb. of prairie grass, 2 lb. cowgrass and 2 lb. of wild white clover seed from the Tongala district. An excellent "strike" of all these species had been achieved.

The pasture areas described, together with a similar area of Wimmera rye-grass and subterranean clover, were supporting Mr. Forryan's herd of 25 cows, since owing to the shortage of irrigation water he had been unable to irrigate his lucerne paddocks this season.

Mr. C. N. Bidstrup, of Byrneside, gained third place with a pasture which had been sown in September, 1937, with the mixture recommended by the Department of Agriculture, viz., 10 lb. certified perennial rye-grass, 4 lb. cocksfoot, 3 lb. Italian rye-grass, 2 lb. perennial red clover, 1 to 2 lb. certified wild white clover, 1 lb. alsyke, and 1 lb. subterranean clover per acre. There was a very good development of the sward for a relatively young pasture, and the exhibit was attractive despite the fact of it having been grazed off just a few days previously. Two bags of super. per acre is the usual dressing of manure applied each year. On Mr. Bidstrup's farm of 380 acres there is a water-right of 126 acre feet. The irrigated area of approximately 100 acres is judiciously divided up into areas of perennial species pasture, annual type pasture, and lucerne. Cereal cropping is carried out on the remainder of the farm, and some crops are irrigated. A small area of summer fodders is put in each year. Eighty-four cows are being milked and almost their sole support is the irrigated pastures and lucerne.

The detailed awards are set out in the accompanying table.

Christmas and New Year Greeting Telegrams

THE Deputy Director, Posts and Telegraphs, advises that arrangements have been made again for the conveyance of Christmas and New Year greetings by telegram on a new gaily-decorated form.

The usual telegraph rates apply, and such telegrams may be lodged on the ordinary form with the word "Greeting" boldly written before the address. The special forms will be available between 14th December, 1938, and 6th January, 1939, and those intending to send greetings are asked to lodge their telegrams as early as possible to ensure timely delivery.

Telephone subscribers may arrange for telegrams by telephone—in the case of metropolitan subscribers by dialling MO75, or country subscribers by calling the nearest telegraph office.

Full details of the facilities are available from all Postmasters, or on application to the Telegraph Branch.

Pyramid Hill Irrigated Pasture Competition

Report of the Judge, L. C. Bartels, B.Agr.Sc., Senior Agrostologist.

DESPITE the dry season a satisfactory number of entries was received for the Irrigated Pasture Competition inaugurated this year by the Pyramid Hill Agricultural Society, and some of these entries were of a high order of merit.

First prize was a shield given by the President, Mr. R. A. Gregory, in memory of his father; while the State Rivers and Water Supply Commission undertook to supply 10 acre-feet of water free to the winner.

The Pyramid district has lagged in the development of sown pastures under irrigation, but interest has been newly awakened, and the experiences of the entrants in this competition should encourage all with irrigation facilities to undertake a programme of pasture improvement. They were positive that their enterprise had been payable, and of course the value of the pastures was emphasized under the adverse conditions which prevailed this year.

The pastures inspected ranged from simple swards of Wimmera rye grass to luxuriant growth of irrigation white clover. There were plots of lucerne and perennial rye grass, mixed perennial pasture with strawberry clover predominant, and some excellent exhibits of subterranean clover and Wimmera rye grass.

These demonstrated that practically all types of pasture may be grown in the district under suitable cultural practices, but the circumstances at Pyramid are such that the annual species, Wimmera rye grass and subterranean clover, have a particular value. Water is allotted for only a section of the big farms there, and the big area to be supplied makes it impracticable to deliver water at frequent intervals. Mixed farming is practised. In many cases the water available is utilized for watering natural grasses in autumn: cereals such as oats, barley and wheat in spring, and annual summer fodders, millet and sorghums, in summer.

Lucerne, which is grown by some farmers, has not been entirely satisfactory, although it is likely that much better results would accrue, particularly on the better soils, if a policy of liberal manuring and regulated grazing were adopted.

The practices outlined have been the vogue for many years. They have their foundation in the fact that in earlier years the water supply was limited and could not be relied upon for a policy of regular irrigation methods, while the watering of annual crops as an insurance against drought or as catch crops did not always justify refined methods of grading.

It must be said that the continuance of these practices is not conducive to good results; the fertility of the land has been lowered and the water has not been used to best advantage. There is need for better watering methods, the establishment of better species, regular and liberal manuring and effective utilization of pastures linked with fodder conservation. If district farmers take the pyramid as a symbol of progress, these four features might appropriately represent the four sides.

All these factors were represented in the pastures inspected, and competitors were asked whether their adoption was of economic value. All were positive that it was. They affirmed that the border system of irrigation greatly facilitated watering and made for the best use of water, that the establishment of subterranean clover was cheaply effected and provided an abundance of nutritious feed, that the application of superphosphate was essential to secure this result, and that the improved production enabled farmers to conserve fodder for lean periods. This evidence is in accord with that obtained in every district, and Pyramid farmers are urged to take advantage of the opportunities presented.

The greatest requirement is top-dressing, and at least 1 cwt. per acre should be given to all land irrigated. This will be a safe investment for all farmers, a contribution to soil fertility which will not be dissipated until used. Ordinarily it will promote a spontaneous growth of trefoils, but, to give full expression to its

White clover is an important constituent of an irrigation pasture sward.

benefits subterranean clover should be introduced. This may be easily done by sowing 2 or 3 lb. of seed per acre with Wimmera rye grass, say 5 lb. per acre. These may be mixed with superphosphate immediately before sowing, and sown through the manure run of the drill. A cover crop may be sown with the grass and clover, but lightly so that the clover is not suppressed. In the early stages it is desirable to give the clover a chance to flower and seed in the spring.

The combination of the two agencies "sub. clover and super." has worked wonders over big areas of the State; they have doubled, and even quadrupled, carrying capacity, and they have renovated worn-out lands, and this is an urgent matter on much of the irrigated land in the north. Farmers at Pyramid may be assured that when their lands have been under clover for a few years they will grow better cereal crops than ever.

It is desirable that all farmers should eschew "hit and miss" methods of irrigation; even this year, when every foot of water is valuable, wasteful practices are evident. The border system of irrigation adopted by all the competitors was commended because it facilitated watering. It made for regular production and saved time and water. Briefly, it means the division of the land into narrow bays by check banks running down the slope. Under the normal conditions at Pyramid, the laying out of the land under this method does not involve much work, because grades are flat. It is recommended that check banks 1 chain apart and 10 to 15 chains long would suit generally; big banks are not needed.

Top-dressing in autumn is likely to be the best practice; the manure may be applied without cultivation and even before watering. In the case of Wimmera rye grass and subterranean clover pastures there is evidence that a

IRRIGATED PASTURE COMPETITION.—PYRAMID HILL.

Judged 25th and 26th October, 1938.

Name of Farmer.	Lay out of Land for Irrigation and Condition of Channels and Drains.	Botanical Composition of Pastures.	General Condition of Pastures.	Evenness of Sward.	Freedom from Weeds.	Total.
	20	20	20	20	20	100
Hetherington, R. ..	18	17	18	16	18	87
Hercus, J. ..	17	14	18	18	18	85
Wood, Chas. and Sons ..	12	19	18	17	18	84
Malone, L. ..	17	14	18	17	15	81
Johnston, J. H. (A exhibit) ..	16	15	16	15	17	79
Johnston, J. H. (B exhibit) ..	17	14	15	16	14	76
Leed, J.	15	16	15	16	12	74
Alford, R.	15	12	13	13	18	71
Dowden, W. (B exhibit) ..	12	13	16	13	16	70
Gregory, R. (B exhibit) ..	11	11	11	17	16	66
Dowden, W. (A exhibit) ..	12	12	12	12	16	64
Gregory, R. (A exhibit) ..	14	11	12	16	11	64

scarifying in autumn, before germination, preserves a better balance of the two species.

This competition has made a good start and it may be expected that many more entries will be forthcoming in a better year. Such competitions have promoted progress in other districts, and a similar result should be forthcoming at Pyramid. Detailed awards are set out in the table on the previous page.

Mr. Ray Hetherington, of Calivil, was awarded highest points for an exhibit of 6½ acres of pasture, mainly irrigation white clover with rye grass and lucerne admixed. Subterranean clover and burr medick were present, too. The land was well graded and check banks were spaced at three to the chain.

The paddock was originally in lucerne, but in 1936 it was ploughed and sown with 2 lb. of Western District rye grass, 4 lb. of lucerne, and 1 lb. of Jackman's irrigation white clover. Barley was also sown at the rate of 1 bushel per acre, and one bag of superphosphate per acre was applied. The barley was stripped and yielded 7 bags per acre. The cover crop had suppressed the pasture elements and the stubble was watered without much result in the first season, but the land was harrowed and again top-dressed with superphosphate at the rate of 1 bag per acre, and in response to regular watering in the 1937-38 season the pasture made good progress. This pasture has been heavily stocked and carried the milking herd of 33 cows for 8- to 10-day periods. Mr. Hetherington maintains that he could not do without superphosphate, and aims to apply a bag twice each year. His experience with this pasture indicates that it will be better than lucerne.

Mr. Jas. Hercus, of Yarrawalla South, presented an area of 60 acres of pasture, mainly subterranean clover and Wimmera rye grass, which was awarded second prize. This pasture has been down three years, and was sown with wheat on fallow. Wimmera rye grass, 4 lb. per acre; subterranean clover, 2 lb. per acre; and lucerne, 2½ lb. per acre, were put in. Superphosphate at the rate of 140 lb. per acre was used. During the last two years the pasture has been top-dressed in February and August at the rate of 140 lb. per acre. The land was in bays 2 chains wide and 30 chains long.

During the last two years the subterranean clover pastures were irrigated twice in autumn and twice in spring; the average absorption was 3 inches per watering. Mr. Hercus has 300 acres of such pastures, and prefers them to lucerne. He has carried five ewes per acre, with 70 per cent. of lambs. They were put on in May, and were not taken off except during watering, and the first consignment of lambs was sold in early October.

Mr. Hercus is convinced of the value of superphosphate, which, he says, augments winter feed. He has experienced no serious troubles amongst the sheep on his improved pastures. An important point in his practice is that he spells the young pasture for five or six weeks in October-November to permit free flowering and re-seeding.

Messrs. Chas. Wood and Sons exhibited a paddock of pasture 9 acres in area. It had a good dense sward of mixed rye grass, strawberry clover, white clover, subterranean clover: and trefoil was interspersed. The land has flat grades.

To maintain this pasture in highly productive condition, 21 inches of water was used last season. This was practicable because Messrs. Wood have a big water-right, and can give the small area extra attention. The pasture has been down seven years, and when sown was put in on fallow in autumn. A mixture of the following species was put in:—New Zealand perennial rye grass, Wimmera rye grass, cocksfoot, Phalaris, red clover, white clover, alsike clover, strawberry clover, and subterranean clover. It was sown with 1 cwt. of superphosphate. During the last few years it has been top-dressed regularly, first with 1 cwt. per acre, last year with 3 cwt. per acre, and this year it will get 5 cwt. per acre.

The pasture has been heavily grazed and has been particularly valuable this year. The high carrying capacity is attributed to the liberal top-dressing. As an adjunct to the annual subterranean clover pastures, this perennial pasture is most useful in giving continuity of green feed when the subterranean clover has died off.

Messrs. Wood and Sons are following a vigorous policy of pasture improvement. They milk 73 cows compared with 42 a few years ago, and it is possible to make ample reserves of grass hay for winter feeding; this was not practicable before they commenced top-dressing.

Mr. L. Malone's entry was an area of 9 acres of Wimmera rye grass and subterranean clover. The pasture was in fresh and vigorous condition, but thistles were a blemish. The pasture had been sown on virgin country, which had

[*Continued on page 620*

Manurial Requirements of Potatoes

By J. T. Ramsay, Potato Expert.

THERE are many methods of increasing the yield of the potato crop, and of improving the quality of the potato itself. Proper seed selection and seed storage, effective disease control, and thorough cultural practices all have their bearing on the production of a good crop; but for the most part, under Victorian conditions, effective use of fertilizers must be made in order to place the crop on an economic basis, and ensure a payable return for labour and money expended. Natural fertilizers, such as farmyard manure, which combine the virtues of both green manure (i.e., a green crop turned under) and artificial manure, are extensively used overseas in potato production because of their cheapness and availability, but the fact that stock are not housed during the winter in this country prevents large stocks accumulating, and so precludes their use here. Therefore, recourse must be made to the use of artificial fertilizers, and the additional use of a crop for soiling or for green manure in order to preserve or improve the physical condition of the soil.

The particular forms of chemical manures, and the rates per acre at which they should be applied, have been the subject of considerable experimental work by the Department of Agriculture. The production of crops of any kind would be a much simpler matter if an all-sufficient artificial fertilizer were available, but owing to climatic variations and the diverse compositions of the soils, abrupt variations of which are often to be found in the one paddock, it is impossible for a standard manurial dressing to be recommended which would be suitable for all classes of soils. The only reliable guide is an actual field test with varying quantities of the standard fertilizers. Tests of this nature have been carried out by the Department in the more important potato-growing areas of the State, the various soil types of which embrace volcanic, light and heavy loams, peat, and clay loam, and much information has been obtained in regard to the manurial requirements of this crop.

When these trials were instituted a comprehensive range of manurial treatments, based on the estimated requirements of the potato crop in each separate district was drawn up. After some years the manurial variations were standardized, and the influence of artificial fertilizers on crop yield has been observed under a very wide range of seasonal conditions, enabling definite recommendations to be made regarding quantity and type of fertilizer that could be applied to the best advantage in each particular district.

Showing the advantage to be gained by applying manure with the seed (right) compared with broadcasting (left).

There is a wide range of artificial fertilizers on the market, supplying either singly or in combination many of the essential elements for plant growth. The only elements it is necessary to add to soils used for potato growing in Victoria are nitrogen, potash, and phosphorus. Formerly, lime was regarded as being beneficial to the crop, but exhaustive tests in a variety of soil types have disproved this belief. In fact, in the majority of cases where lime was applied to the crop, not only was there no benefit in regard to yield, but an actual decrease occurred. The explanation of this is that the potato plant prefers an acid to an alkaline soil, the action of lime being to produce or increase alkalinity.

Of the three elements referred to, the most important is phosphorus, Victorian soils as a class being markedly deficient in this essential. Next in order of importance is nitrogen, while potash is of least consequence. These fertilizers are obtainable in varying forms, the principal of which, as far as the potato crop is concerned, are detailed as follows:—

Phosphatic Manures.

Superphosphate—containing 22 per cent. phosphoric acid—mostly water soluble.

Basic Phosphate—containing 18 per cent. phosphoric acid—mostly citrate soluble.

Nitrogenous Manures.

Sulphate of Ammonia—containing about 20 per cent. nitrogen.

Nitrate of Soda—containing 15.5 per cent. nitrogen.

Dried Blood—containing from 11.5 to 13 per cent. nitrogen.

Potassic Manures.

Sulphate of Potash—containing 48.5 per cent. potash.

Muriate of Potash—containing 50 per cent. potash.

Compound Manures.

Superphosphate and Ammonia (3:1)—containing 16.5 per cent. phosphoric acid and 5 per cent. nitrogen.

Superphosphate and Ammonia (6:1)—containing about 18.5 per cent. phosphoric acid and nearly 3 per cent. nitrogen.

Blood and Bone—containing from 10 to 20 per cent. phosphoric acid, and from 3 to 7.5 per cent. nitrogen.

Bone and Superphosphate—containing from 16.5 to 22 per cent. phosphoric acid, and from 1 to 2 per cent. nitrogen.

Nitro-Superphosphate—containing about 20 per cent. phosphoric acid, and 2 per cent. nitrogen.

Spreading fertiliser by hand.

There are certain forms of the various artificial manures which are more suitable for application to the potato crop than others, either because of their influence on quality or production, or both. The best form in which to apply phosphoric acid is as superphosphate. This fertilizer has a considerable beneficial influence on the table quality of the potato, and a still greater influence on yield. When used alone it has the effect of shortening the period of maturation of the crop by from two to three weeks. This aspect is most important to growers who wish to have their crop on the market as early in the season as possible, in order to secure the high prices usually obtainable at that time. It must be pointed out, however, that the shortening of the growing period by the application of superphosphate alone, is accompanied by a sacrifice in yield as compared with that obtained from the use

of a combined phosphoric and nitrogenous manure. Tests have shown that the potato plant takes its nourishment from the soil at a much faster rate in the early stages of growth than later in the season, which fact provides another reason why superphosphate is the best form in which the phosphoric acid can be applied, as practically all is water soluble, and therefore becomes immediately available to the crop in its earliest root movement. Phosphatic manures, unlike nitrogenous manures, are not lost by leaching.

Nitrogen should be used for potatoes only in the form of sulphate of ammonia or as dried blood. When used as nitrate of soda, the result usually is to produce tubers of lower table quality. Further, the high solubility of nitrate of soda permits leaching from the soil by heavy rains, and thus its effect on the crop is lost. Ammonium sulphate is not so readily soluble as nitrate of soda, but acts quickly enough to enable it to be assimilated as required by the crop.

For years potash was considered to be an essential fertilizer for the potato crop, but, with one or two exceptions, it has not been successful in increasing potato yields in Victoria. Recent reports of research work in other countries indicate that its value there is being questioned. It does, however, have a beneficial effect on the table quality of the tubers, provided that the sulphate form is used. If applied in the form of muriate or chloride, the quality is lowered even when so small a quantity as 1 cwt. per acre is used. The soils in most districts of this State are sufficiently well supplied with potash so far as potatoes are concerned, and although their potash content, on the average, does not meet the apparent requirements of the crop (as determined by tuber analysis), it would seem from the experimental data obtained that there is ample potash in an available form to suit the demands of the crop under normal climatic conditions.

MANURIAL TREATMENT FOR POTATOES.

District.	Soil.	Average Annual Rainfall.	Period of Trials.	Manurial Dressing Recommended per Acre.	Average Yield per Acre.	Percentage Yield Increase over No Manure
		Inches.	Years.		T. C.	%
Western—						
Beech Forest	Clay loam ..	60	7	7 cwt. superphosphate and ammonia, 6 : 1	7 3	123
Illowa ..	Red volcanic loam	28	10	4 cwt. superphosphate and ammonia, 3 : 1	7 12	50
Koroit ..	Black volcanic loam	28	7	4 cwt. superphosphate and ammonia, 3 : 1	7 13	27
Central—						
Millbrook ..	Red volcanic loam	35	10	4 cwt. superphosphate and ammonia, 3 : 1	6 1	109
Musk ..	Red volcanic loam	45	10	4 cwt. superphosphate and ammonia, 3 : 1	5 11	63
Romsey ..	Red volcanic loam	28	10	4 cwt. superphosphate and ammonia, 3 : 1	6 2	28
Trentham ..	Red volcanic loam	45	11	4 cwt. superphosphate and ammonia, 3 : 1	6 3	105
Wheatsheaf	Red volcanic loam	45	10	4 cwt. superphosphate and ammonia, 3 : 1	6 0	69
Gippsland—						
Catani ..	Swamp peat ..	35	6	7 cwt. superphosphate and ammonia, 6 : 1	5 16	147
Childers ..	Clay loam ..	40	10	7 cwt. superphosphate and ammonia, 6 : 1	5 17	154
Fish Creek	Grey clay loam ..	50	9	7 cwt. superphosphate and ammonia, 6 : 1	9 6	92
Korumburra	Grey clay loam ..	45	5	7 cwt. superphosphate and ammonia, 6 : 1	10 12	107
Warragul ..	Clay loam ..	35	11	7 cwt. superphosphate and *potash*, 6 : 1	8 7	92

[*Continued on page 620.*

Home Preservation of Fruit

By Miss A. Knight

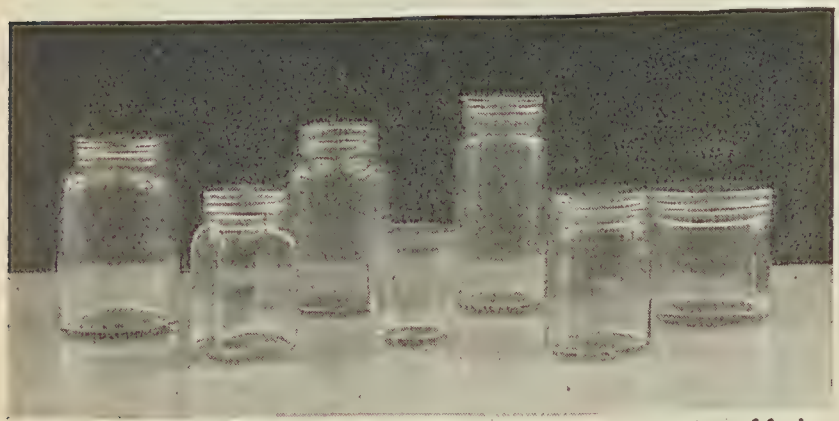
THE preservation of fruit for immediate and future use is an absorbing hobby to the average housewife. A good supply of bottled fruit not only adds variety to the table all the year round, but also serves as a means of using excess produce from the orchard thus preventing any waste.

The utensils required for home bottling of fruit will probably be found in every kitchen. Any deep vessel, such as an ordinary household meat boiler, electric or gas urn, wash copper, &c., will provide an excellent sterilizer in which to process fruit in the home. The vessel selected should have a reasonably tight fitting cover, and be deep enough to take the preserving jars. They should also allow for a small removable rack to be placed inside the boiler on which to rest the jars during processing, and thus raising them an inch or so from the intense heat during sterilization. For this purpose, a wire cake cooler, obtainable from most hardware stores, or a small wooden platform made from narrow slats of wood held together on two firm supports, will meet the requirements.

Other necessities are a kettle or preserving pan in which to make the syrup, and two or three bowls to hold fruit during the grading and preparation, sharp peeling knives so as to enable a clean cut surface on the fruit, and a long thin packing stick with a smooth end for arranging the fruit in position in the jar. A suitable can in which to make a caustic soda solution for dipping peaches when peeling for bottling, will also be required. It is unwise to use a good utensil for this purpose, as the caustic soda solution will soon ruin it, therefore a petrol tin, cut to a convenient size will serve the purpose quite well, and may be replaced when required.

Any make of glass jar, provided that it can be made airtight, may be used successfully as a container. Careful inspection of each jar before packing fruit into it will eliminate a good deal of subsequent trouble, for it is necessary that the jar be made absolutely airtight if the contents are to be kept in a good condition. The rim round the neck of the jar on which the lid rests should be carefully examined, and if the glass is chipped it should be discarded. Examine also the lids, to see that there are no cracks or flaws. There must be no rocking of glass lids when placed on the jar, and dinted metal lids should not be used.

Rubber bands are supplied with most preserving jars; these differ in shape slightly, according to the particular make of jar to which they belong. Rubber bands require to be renewed each year, as the heat and pressure tend to perish them; it is very important that these be in a good condition.



A variety of air-tight, glass jars suitable for the home bottling of fruit.

Graded Peaches.

Selection and Classification of Fruit.

It is not always possible to obtain a quantity of fruit of the quality and grade one would like for bottling, and in order that one may get the best results from a given quantity, it may be an advantage to commence by making three distinct grades and utilize each grade in a manner for which it is best suited. The following grades are suggested :—

No. 1 *Grade.*—This lot should consist of fruit even in size, shape and colour, be firm ripe, and free from skin blemish. This grade should be used for bottling.

No. 2 *Grade* may consist of blemished, bruised, or broken specimens, which may be utilized for conserves, puree, juice extractions, &c.

No. 3 *Grade* may consist of slightly under-ripe, blemished, or mis-shapen fruit, and these are suitable for jelly making, the slightly under-ripe specimens contain the pectin necessary for a good jelly, it not being present in sufficient quantity when the fruit becomes fully ripe.

Having selected and graded the fruit, apricots for example, the first or No. 1 grade may be preserved whole, or they may be halved and the stone removed according to fancy and convenience. If the stone is allowed to remain in the fruit it will impart a nutty flavour which is palatable to many, while others prefer not to have it. Pack the fruit firmly into the preserving jar, add about one tablespoonful of syrup (for syrup see below) so as to moisten the fruit, place the lid lightly on the jar, but do not tighten the sealing levers; place the jars on the little platform inside the sterilizer, with sufficient water to come just below the surface of the platform. Put the lid on the sterilizer and allow the water to come slowly to boiling point. Take the time as soon as this temperature is reached, then allow 20 to 25 minutes (according to the style of the pack in the jar, a close pack takes slightly longer than a loose pack), then fill each jar to overflowing with boiling syrup. Adjust the rubber band and seal to make airtight at once. Set the hot jars on a folded wet towel to cool. Avoid a draught of cold air coming in contact with the hot jars.

When treating No. 2 grade, a longer cooking at a lower heat may be desired, if so, bring the contents of the boiler slowly to a temperature of 180° F., and allow one hour at that temperature. Finish off in a similar manner to that described for No. 1 grade.

Peaches.

The clingstone variety of peach is usually preferred for bottling. Halve the fruit, and remove the stone either with a sharp-edged teaspoon, or a pitting spoon.

Make a convenient volume of caustic soda solution, dissolving the soda at the rate of 1 oz. (1 tablespoon) to 1 quart of water. When the solution comes to boiling temperature, place the peaches in a four-cornered cloth, and immerse them for about forty seconds, do not overcrowd them, and see that all fruit is covered while in the soda bath. Remove them from the soda, and wash under running water, or in several changes of fresh water. The soda will remove the skin, and when washed the peaches should be a clear yellow, they should be dropped straight into slightly salted water until a sufficient quantity is ready for bottling. They are then ready to be packed into the jars and then each jar should be filled with cold syrup. Pockets of air are likely to be caught in the hollow part of the fruit. To dislodge these, agitate the jar by rotating quickly until the air is released. Place the jars in the sterilizer and allow about 45 minutes after boiling temperature is reached. Then finish as described for apricots.

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Pears.

Williams Bon Chretien and Packham's Triumph pears are generally preferred for bottling, though all varieties are more or less suitable for the purpose. They must be peeled, and may be cut, or left whole, as desired. All pears will discolour if they are left exposed to the air after peeling, and to prevent this they should be dropped into a basin of salted water (about 1 tablespoonful to 1 quart water), but they should not remain there longer than is necessary as they will readily soften and spoil. As soon as a sufficient quantity has been prepared, they should be taken from the salt water, rinsed thoroughly in fresh water, packed firmly into jars, each jar filled with syrup, processed for 40 minutes or so, according to variety and pack, then finished similarly to apricots.

Quinces.

Peel, core, and cut the quinces as desired, fill the packed jars with cold syrup, and process them until the fruit is tender and of the desired colour. If given a long slow heating a deep red colour may be obtained, but if a light colour is desired, cook only until the quinces are tender, and finish off as described for other fruit. Quinces may be done in a casserole in the oven.

They should not be over-ripe. Peel, core, and cut the fruit into sections, cover in the casserole with syrup made with 8 oz. sugar to 1 pint water. Set the casserole in the cool part of a one-fire stove, or where they will cook very slowly for several hours, utilizing waste heat. Cooked in this way they become rich in flavour and colour, and plump in appearance. At this stage, and while at a high temperature, ladle fruit and syrup carefully into the heated jars and hermetically seal while very hot.

Plums.

All firm-fleshed plums are suitable for bottling, they must not be too ripe, and if preferred, the slip-stone varieties may be halved, stoned and packed according to fancy.

Peaches being dipped in boiling caustic solution to remove skins.

Green Gooseberries are preferable to the ripened ones for bottling, and these are usually done in water, though if desired a weak syrup may be used.

Loganberries should be selected when very firm ripe; if bottled when fully ripe, they do not retain the colour so well.

Raspberries—Select the early raspberries for preference, and treat as soon as possible after picking.

Preparation of Syrup.

To prepare the syrup for the above fruits put the required quantity of water into a kettle or preserving pan, and when boiling add 4 to 6 oz. of sugar to each pint of water, then allow to boil for 8 to ten minutes. It should then be strained and cooled in readiness for use as required.

Licensed Skin Buyers

(Supplementary List)

Sheep Owners Protection Act

Following is a list of persons licensed under the Sheep Owners Protection Act to buy raw sheep skins. The licences have effect until the 31st December, 1938.

Licence No.	Name.	Address.	Licence No.	Name.	Address.
766	Anderson, R. ..	Meeniyan	768	Johnstone, W. A. ..	Casterton
775	Archibald Bros. ..	Beulah	760	Krew, Eli ..	278 Rathdown-street, North Carlton
772	Armstrong, F. ..	56 Cutter-street, Burnley			
764	Bourke, R. T. ..	Koondrook	754	McClintock, A. E. ..	Digby
774	Butler, R. A. ..	195 Queen-street, Bendigo	759	McKee, J. R. ..	48 Sackville-street, Kew
752	Byerley, H. M. ..	c/o C. S. McLeod, 9 Nyowie-street, Regent	776	McMillan, R. H. ..	Maffra
			773	Patterson, D. D. ..	Nhill
758	Causer, H. B. ..	Wal Wal	771	Pincini, J. ..	Mirboo North
761	Delfendahl, O. ..	Orbost	753	Rice, W. ..	Bombala, N.S.W.
765	Douglas, D. W. ..	Stuart Mill	763	Rutter, J. ..	3 Johnson-street, Stawell
777	Harper, W. ..	Alberton	757	Schneider, E. V. and Son	Sea Lake
755	Henderson, A. H. F.	Barham, N.S.W.			
769	Howlett, A. E. ..	Casterton	770	Timms, N. ..	Minyip
762	Janson, C. H. ..	Rochester	767	Wheeler, F. E. ..	Tallangatta
756	Jobe, C. E. ..	Minyip			

Tubercle Free Herds

The following herds have been declared free of tuberculosis under the scheme conducted by the Department of Agriculture. Under this scheme a tuberculosis-free accredited herd of cattle is one in which the entire herd has passed two negative, successive, annual physical examinations and tuberculin tests, or, upon disclosure of infection, three semi-annual, successive physical examinations and tuberculin tests applied by a State Veterinarian or by a qualified and registered veterinarian who is approved by the Chief Veterinary Inspector for that purpose.

ACCREDITED TUBERCLE FREE HERDS.

Herd Number.	Name.	Address.	Number in Herd.	Herd Number.	Name.	Address.	Number in Herd.
1	State Research Farm	Werribee ..	259	10	Banyule Stud Pty. Ltd.	Heidelberg ..	122
2	Warragul High School	Warragul ..	35				
3	Payne, A. E. T. ..	"Yarra View," Lilydale	80	11	McIntosh, John ..	"Burnwood," Merrigum	31
4	Dennis, Mrs. A. A. ..	Frankston ..	14	12	Black, Mrs. Agnes ..	Mount Noorat	40
5	Lady Talbot Milk Supply Company	Cranbourne ..	418	13	Black, I. S. ..	"The Cottage," Mount Noorat	44
6	Reid, Ralph G. ..	"Holmwood," Koo-wee-rup	99	14	Read, John D. ..	"Springhurst Estate," Springhurst	99
7	Harris, J. W. ..	"Rowena," Clyde	72	15	Kelly, C. ..	"Glenmore," Creighton's Creek, Euroa	22
8	School of Horticulture	Burnley ..	8				
9	Lawrence, P. H. ..	"Rainga," Tarrawarra	59	16	Gorman, A. W.	"Cathcart," Alexandra	57

Victorian Plums and Peaches

Cool Storage and Export

By G. B. Tindale, B.Agr. Sc.; F. E. Huelin, B.Sc., Ph.D.† and S. A. Trout, M.Sc., Ph.D.†*

INVESTIGATIONS concerning the cool storage of plums and peaches have been proceeding for some years at the Government Cool Stores, Melbourne, the work being carried out by the Victorian Department of Agriculture working in co-operation with the Council for Scientific and Industrial Research. The results of earlier experiments have been published in the *Journal of the Department of Agriculture* (3.4).

Briefly, in these reports the storage life of several varieties of plums and peaches, when stored at 32° F. and other temperatures, has been given, 32° F. being the temperature recommended for the storage of these fruits. The storage life at any particular temperature is regarded as the maximum time the fruit can be stored at that temperature, and still ripen normally when transferred to a suitable ripening temperature. When stored beyond this period at low temperatures, it is found that various disorders develop within the fruit when removed to a suitable ripening temperature.

With plums, slight overstorage results in failure to develop full juice and flavour. With further overstorage the plums fail to develop flavour and juice, but become dry and mealy, while with still further overstorage they develop internal disorders. These disorders appear as a dark brown discolouration of the flesh which is accompanied by an objectionable taste and odour.

With peaches, a very similar series of disorders develops when ripening is attempted with fruit which has been overstored at low temperatures. With slight overstorage the peaches lack flavour and juice on ripening. With further overstorage they fail to develop any juice or flavour, and in this condition are quite dry or mealy and sometimes termed "woolly". With still further overstorage the flesh of the peach discolours, the flesh of some varieties turning red, while with other varieties the flesh turns brown. At the same time, the peach develops an objectionable taste and odour, while often the skin develops a network of very fine cracks and readily parts from the flesh when the peach is handled.

The successful storage of plums and peaches is difficult, as there is no means of determining from outward appearance whether these fruits are overstored or not. In other words, although one knows by past experience that a particular variety may be overstored, yet its appearance at low temperatures does not suggest that it has passed into the overstored state.

Rees Davies and his co-workers in South Africa[2], and the present authors in Victoria have stored plums and peaches at a range of temperatures, and it has been found that, as the temperature is raised above 32° F, the disorders

TABLE I.—THE STORAGE LIFE* IN WEEKS OF SEVEN VARIETIES OF PLUMS AT 32° F, 34° F, 37° F, 40° AND 45° F.

Variety.	Maturity.	Date of Picking.	Storage Life in Weeks at				
			32°.	34°.	37°.	40°.	45°.
Wickson ..	1	12.1.37	4	4	4	4½	9
	2	18.1.37	3	3	3	3½	8
	3	18.1.37	3	2½	2	2½	7
Satsuma ..	1	12.1.37	9	5	2	7	5
	2	12.1.37	8	4	2	7	5
	3	20.1.37	7	3	1	6	4
Jefferson Gage ..	1	15.1.37	7	5	5	7	7
	2	22.1.37	6	4	4	6	6
	3	22.1.37	5	4	3	5	5
King Billy ..	1	20.1.37	6	6	6	6	6
	2	28.1.37	5	2	2	2	5
Grand Duke	1	26.1.37	7	4	4	4	5
	2	4.2.37	6	3	3	4	4
	3	24.2.37	7	2	2	3	2
Golden Drop	1	26.1.37	7	6	6	9	9
	2	9.2.37	6	5	4½	8	6
	3	16.2.37	6	6	6	5	5
President ..	1	4.2.37	5	4	2	2	6
	2	9.2.37	4	3	2	2	5
	3	19.2.37	4	3	3	3	4

* The storage life as here recorded is the maximum time that plums can be kept at the above temperatures if they are to ripen normally and still be in good condition after a week at 65° F.

* Cold Storage Research Officer of the Victorian Department of Agriculture.
† Officers of the Commonwealth Council for Scientific and Industrial Research. Dr. S. A. Trout was associated with the work up to 1937.

of overstorage develop more quickly, and the higher the temperature the earlier do they appear. This relationship holds until the storage temperature is raised to a point termed the minimum ripening temperature. At this temperature the fruit will gradually ripen in store with the full development of juice and flavour normal to the variety, and no disorders develop. In the case of plums, the storage life decreases with rise of temperature up to about 37° F., and then increases again as the minimum ripening temperature is approached (see Table I). With further storage at the minimum ripening temperature, the fruit becomes overripe, which condition is recognised more by the development of a rather fermented taste than by excessive softness, which occurs more when fruit becomes overripe at higher temperatures. Actually, fruit may remain at the minimum ripening temperature for several weeks before becoming unmarketable.

It has been found that the minimum ripening temperature for plums and peaches varies, not only according to variety but also with the stage of maturity of the fruit, more mature fruit ripening at somewhat lower temperatures than less mature fruit. Generally speaking, the minimum ripening temperature for mature plums approximates 40–46° F., while for mature peaches the range is approximately 45–55° F.

TABLE II.—STORAGE TESTS—PLUMS.

Combination of Temperatures.	Total Storage Life.
Grand Duke.—Stored 26.1.38.	
32° and 55°	9 weeks equals 6 weeks at 32° plus 3 weeks at 55°
32° „ 50°	9 „ „ 5 „ 32° „ 4 „ 50°
32° „ 46°	11 „ „ 4 „ 32° „ 7 „ 46°
32° „ 43°	8 „ „ 3 „ 32° „ 5 „ 43°
32° „ 40°	Fruit develops disorders and fails to ripen at these
32° „ 37°	temperatures.
President.—Stored 9.2.38.	
32° and 55°	8 weeks equals 4½ weeks at 32° plus 3½ weeks at 55°
32° „ 50°	9 „ „ 4½ „ 32° „ 4½ „ 50°
32° „ 46°	10 „ „ 4½ „ 32° „ 5½ „ 46°
32° „ 43°	11½ „ „ 3½ „ 32° „ 8 „ 43°
32° „ 40°	13 „ „ 1½ „ 32° „ 11½ „ 40°
32° „ 37°	Fruit develops disorders and fails to ripen at this temperature.
Cole's Golden Gage.—Stored 25.1.38.	
32° and 55°	16 weeks equals 12 weeks at 32° plus 4 weeks at 55°
32° „ 50°	16 „ „ 11 „ 32° „ 5 „ 50°
32° „ 46°	16 „ „ 10 „ 32° „ 6 „ 46°
32° „ 43°	17 „ „ 9 „ 32° „ 8 „ 43°
32° „ 40°	18 „ „ 8 „ 32° „ 10 „ 40°
32° „ 37°	16 „ „ 2 „ 32° „ 14 „ 37°
Golden Drop.—Stored 26.1.38.	
32° and 55°	8 weeks equals 5 weeks at 32° plus 3 weeks at 55°
32° „ 50°	9 „ „ 4½ „ 32° „ 4½ „ 50°
32° „ 46°	11 „ „ 4½ „ 32° „ 6½ „ 46°
32° „ 43°	12 „ „ 4 „ 32° „ 8 „ 43°
32° „ 40°	11 „ „ 1 „ 32° „ 10 „ 40°
32° „ 37°	Fruit develops disorders and fails to ripen at this temperature.
Reine Claude de Bavay.—Stored 25.1.38.	
32° and 55°	8½ weeks equals 4½ weeks at 32° plus 4 weeks at 55°
32° „ 50°	10 „ „ 4½ „ 32° „ 5½ „ 50°
32° „ 46°	11 „ „ 4½ „ 32° „ 6½ „ 46°
32° „ 43°	11 „ „ 2½ „ 32° „ 8½ „ 43°
32° „ 40°	7 „ „ 1½ „ 32° „ 5½ „ 40°
32° „ 37°	Fruit develops disorders and fails to ripen at this temperature.

TABLE II.—STORAGE TESTS (PLUMS)—*continued.*

Combination of Temperatures.	Total Storage Life.
King Billy.—Stored 11.1.38.	
32° and 55°	6½ weeks equals 4½ weeks at 32° plus 2 weeks at 55°
32° „ 50°	8 „ „ 4½ „ 32° „ 3½ „ 50°
32° „ 46°	10 „ „ 4½ „ 32° „ 5½ „ 46°
32° „ 43°	10 „ „ 2½ „ 32° „ 7½ „ 43°
32° „ 40°	Fruit develops disorders and fails to ripen at these
32° „ 37°	temperatures.
Narrabeen.—Stored 12.1.38.	
32° and 55°	9 weeks equals 6 weeks at 32° plus 3 weeks at 55°
32° „ 50°	10½ „ „ 6 „ 32° „ 4½ „ 50°
32° „ 46°	13 „ „ 6 „ 32° „ 7 „ 46°
32° „ 43°	13 „ „ 5 „ 32° „ 8 „ 43°
32° „ 40°	Fruit develops disorders and fails to ripen at these
32° „ 37°	temperatures.
Shipper.—Stored 17.1.38.	
32° and 55°	8½ weeks equals 5½ weeks at 32° plus 3 weeks at 55°
32° „ 50°	9½ „ „ 5½ „ 32° „ 4 „ 50°
32° „ 46°	11½ „ „ 5½ „ 32° „ 6 „ 46°
32° „ 43°	12½ „ „ 4½ „ 32° „ 8 „ 43°
32° „ 40°	13½ „ „ 3½ „ 32° „ 10 „ 40°
32° „ 37°	Fruit develops disorders and fails to ripen at this temperature.
Wickson.—Stored 10.1.38.	
32° and 55°	7 weeks equals 4½ weeks at 32° plus 2½ weeks at 55°
32° „ 50°	8 „ „ 4½ „ 32° „ 3½ „ 50°
32° „ 46°	9½ „ „ 2½ „ 32° „ 7 „ 46°
32° „ 43°	Fruit develops disorders and fails to ripen at these
32° „ 40°	temperatures.
32° „ 37°	
Satsuma.—Stored 19.1.38.	
32° and 55°	6½ weeks equals 4 weeks at 32° plus 2½ weeks at 55°
32° „ 50°	7 „ „ 4 „ 32° „ 3 „ 50°
32° „ 46°	8 „ „ 2 „ 32° „ 6 „ 46°
32° „ 43°	7½ „ „ 1 „ 32° „ 6½ „ 43°
32° „ 40°	Fruit develops disorders and fails to ripen at these
32° „ 37°	temperatures.

In the past a storage temperature of 32° F has been recommended for both plums and peaches, but it appears that it might be possible to obtain a longer total storage life by combining an initial storage period at 32° followed by storage at the minimum ripening temperature. During 1938, a series of experiments on these lines was carried out. Six varieties of European plums, four varieties of Japanese plums, and five varieties of peaches were stored at 32° F., and at weekly intervals removals were made to 37° F., 40° F., 43° F., 46° F., 50° F., 55° F. in the case of the plums, and to 45° F., 50° F., 55° F., 60° F., 65° F. in the case of the peaches. The results of the experiments are set out in Table II. (plums) and in Table V. (peaches). These results are based on one season's work only and need confirmation, but they are being published at this stage, as they suggest a possible modification of present practice.

Referring to Table II., it will be seen that plum varieties vary considerably in their length of storage life at the various combinations of temperature. After prolonged storage at 32° F. all varieties failed to ripen and ultimately developed disorders. But if stored at 32° F. for a limited period, which varied from four weeks with Satsuma plums to 12 weeks with Cole's Golden Gage, the plums ripened normally on removal to 55° F. With progressively lower ripening temperatures the storage life at 32° F. decreased, but the time required for subsequent ripening

TABLE III.—MAXIMUM STORAGE LIFE.

Variety.	Maximum Storage Life.	Combination of Storage Temperatures Resulting in Maximum Storage Life.
	Weeks.	
Cole's Golden Gage	18	8 weeks at 32° + 10 weeks at 40°
Grank Duke	11	4 „ 32° + 7 „ 46°
President	13	1½ „ 32° + 11½ „ 40°
Golden Drop	12	4 „ 32° + 8 „ 43°
R. Claude de Bavay	11	2½ „ 32° + 8½ „ 43°
King Billy	10	2½ „ 32° + 7½ „ 43°
*Narrabeen	13	5 „ 32° + 8 „ 43°
*Shipper	13	3 „ 32° + 10 „ 40°
*Wickson	9½	2½ „ 32° + 7 „ 46°
*Satsuma	8	2 „ 32° + 6 „ 46°

* Japanese varieties.

increased. The total storage life was made up of the storage life at 32° F. plus the time taken to ripen and remain in good condition at the ripening temperature. With most varieties the total storage life increased as the ripening temperature was lowered until a point was reached just above the minimum ripening temperature (which varied from 37° F. with the Cole's Golden Gage to 46° F. with the Wickson variety).

Table III. sets out the maximum storage life obtained for each plum variety and the particular combination of temperatures which resulted in the maximum storage life. It would appear from this table that where mixed varieties of plums are stored together, the combination of temperatures to be adopted should be 32° F. and 46° F., for with this combination no variety would develop disorders and all would ultimately ripen, the storage life of some varieties, however, being somewhat less than the maximum obtainable.

From the export point of view, the 32°–46° F. combination is of particular importance, because

TABLE IV.—SHOWING STORAGE LIFE AT 32°–46° COMBINATION, ETC.

Variety.	Storage Life 32°, 46° F. Combination.	Maximum Period at 32° F.	Time to Ripen at 46° F.
	Weeks.	Weeks.	Weeks.
Cole's Golden Gage	16	10	6
Grand Duke	11	4	7
President	10	4½	5½
Golden Drop	11	4½	6½
R. Claude de Bavay	11	4½	6½
King Billy	10	4½	5½
Narrabeen	13	6	7
Shipper	11	5	6
Wickson	9½	2½	7
Satsuma	8	2	6

plums exported from Victoria to England arrive in England at the time of the year when the atmospheric temperature approximates to 46° F., and hence the plums must ripen at 46° F. during the process of marketing. The storage life at the 32°–46° F. combination is set out in Table IV., which also states the maximum period at 32° F. to permit of normal ripening at 46° F.

From Table IV. it will be seen that the European plums, as a class, offer much better prospects for export than do the Japanese varieties, the rather longer storage life of the European varieties being of great importance where the shipping and marketing period occupies about eight weeks. Indeed, in order to obtain the maximum storage life for the European varieties at the 32°–46° F. combination, it is necessary to hold these plums for a period of one month at 32° F., which period at 32° F. is too long for the Japanese varieties, Wickson and Satsuma. Under such conditions the Wickson and Satsuma develop disorders, and this conclusion is confirmed by reports received from London. Plums exported at present are shipped at 32° F. throughout, and reports from London concerning the outturn of the Wickson variety state that its condition when exposed for sale is so bad (due to disorders) that, in the future, export of this variety should not be permitted.

It will be seen from Table IV. that most of the varieties of plums could only be kept for about four weeks at 32° F. if they were to ripen normally at 45° F. after removal. As a week's delay for cooling, packing, &c., before shipping is quite usual, and as most of the cargoes are not landed in England until about five weeks from the date of shipping, it is possible that the present practice of keeping plums at temperatures in the neighborhood of 32° F. for the whole

voyage may have to be modified, and it may be necessary to raise the temperature from 32° F. to 45° F. not later than three weeks after shipping.

Special reference may be made to the outstanding behaviour of the Cole's Golden Gage. Reference to Table III. shows that this variety will stand ten weeks at 32° F. and still ripen normally at 46° F. Hence this variety can be shipped along with pears at 32° without any disorders developing. Here again the London reports are of value, for they invariably point out the excellent condition of this variety, which is usually sold at the highest prices. It usually ripens normally and is hence suitable for a dessert article, whereas most other varieties are at present sold as a culinary plum on account of their failure to ripen normally.

Peaches.

During the 1938 season, five superior dessert varieties of peaches were stored at the combinations of temperature set out in Table V. The earlier maturing varieties Zerbe and Hooker did not have as long a storage life as the later maturing varieties, Smith, Catherine Anne and Late Crawford, and this result is in agreement with earlier results.

Referring to the results with the Catherine Anne variety, it will be seen that a relationship holds similar to that outlined in the case of the plums. As the ripening temperature is reduced, the storage life obtained by adding the maximum period at 32° F. to the subsequent period required to ripen at the ripening temperature is progressively increased. This relation holds down to the 32°–50° F. combination, but not down to the 32°–45° F. combination. As shown in the Table, the storage life of the Catherine Anne variety progressively increased from 8½ weeks at the 32°–65° F. combination to 10 weeks at the 32°–50° F combination.

TABLE V.—STORAGE EXPERIMENTS—PEACHES.

Combination of Temperatures.	Total Storage Life.
Zerbe.—Stored 11.1.38.	
32° and 65°	6 weeks equals 5½ weeks at 32° plus ½ week at 65°
32° „ 60°	6 „ „ 5 „ 32° „ 1 „ 60°
32° „ 55°	6½ „ „ 5 „ 32° „ 1½ weeks at 55°
32° „ 50°	6½ „ „ 4½ „ 32° „ 2 „ 50°
32° „ 45°	6½ „ „ 3 „ 32° „ 3½ „ 45°
Hooker.—Stored 12·1·38.	
32° and 65°	5 weeks equals 4½ weeks at 32° plus ½ week at 65°
32° „ 60°	5½ „ „ 4½ „ 32° „ 1 „ 60°
32° „ 55°	6 „ „ 4½ „ 32° „ 1½ weeks at 55°
32° „ 50°	Fruit fails to ripen and develops disorders at these
32° „ 45°	temperatures.
Smith.—Stored 25.1.38.	
32° and 65°	10 weeks equals 9 weeks at 32° plus 1 week at 65°
32° „ 60°	9 „ „ 8 „ 32° „ 1 „ 60°
32° „ 55°	9 „ „ 7½ „ 32° „ 1½ weeks at 55°
32° „ 50°	8 „ „ 5½ „ 32° „ 2½ „ 50°
32° „ 45°	8 „ „ 5 „ 32° „ 3 „ 45°
Catherine Anne.—Stored 1.2.38.	
32° and 65°	8½ weeks equals 8 weeks at 32° plus ½ week at 65°
32° „ 60°	9½ „ „ 8½ „ 32° „ 1 „ 60°
32° „ 55°	10 „ „ 8½ „ 32° „ 1½ weeks at 55°
32° „ 50°	10 „ „ 6½ „ 32° „ 3½ „ 50°
32° „ 45°	9 „ „ 5 „ 32° „ 4 „ 45°
Late Crawford.—Stored 10.2.38.	
32° and 65°	10 weeks equals 9 weeks at 32° plus 1 week at 65°
32° „ 60°	10 „ „ 9 „ 32° „ 1 „ 60°
32° „ 55°	10 „ „ 8 „ 32° „ 2 weeks at 55°
32° „ 50°	10 „ „ 7 „ 32° „ 3 „ 50°
32° „ 45°	9 „ „ 6 „ 32° „ 3 „ 45°

The maximum time the Catherine Anne could be left at 32° F. to permit of normal ripening at 50° F. was 6½ weeks, but when the ripening temperature was raised to 65° F. (the optimum), it was found that the maximum period this peach could be left at 32° F. to permit of normal ripening at 65° F. was increased to eight weeks. The advantage of the increased storage period at 32° F., where ripening occurred at 65° F. was lost, however, by reason of the much quicker ripening at 65° F. than at 50° F., the ripening periods at these temperatures being ½ and 3½ weeks respectively.

Referring to the Zerbe and Hooker varieties, it will be seen that the storage life of both varieties was relatively short. At all combinations of temperature, the storage life of Zerbe was six weeks approximately, while the storage life of the Hooker increased from five weeks at the 32°–65° F. combination to six weeks at the 32°–55° F. combination. The Hooker failed to ripen at both the 32°–45° F. combination and the 32°–50° F. combination.

With the Smith variety, the storage life was approximately the same, nine to ten weeks at the 32°–65° F, 32°–60° F., and the 32°–55° F. combinations, but was only eight weeks at the 32°–50° F. and 32°–45° F. combinations. The Late Crawford variety gave a storage life of ten weeks at all combinations of temperature, except for the 32°–45° F. combination, in which case the storage life was one week less.

Local Storage and Export.

From a local storage point of view, there is nothing to be gained by attempting long storage of early maturing varieties, and hence it is only the late maturing varieties, which should be considered in this regard. Before stating the maximum storage period at 32° F. for the above late maturing varieties, it is necessary to consider the temperatures at which the peaches would be exposed during marketing. No variety of peach could be stored beyond early April, when the temperatures in Victoria would not be below 55° F. In the above experiments, Catherine Anne and Late Crawford peaches could be kept for eight weeks at 32° F. and still ripen subsequently at 55° F. A storage life as long as this has not always been obtained in previous years' work, but one can expect a storage life of about six weeks for these two varieties.

The export of peaches has not yet been attempted successfully, the storage life being generally too short to permit of holding at 32° F. for the whole of the voyage if they are to ripen subsequently at 45° F. It might be possible to obtain better results by raising the temperature from 32° F. to 45° F. during the voyage.

Maturity of Plums and Peaches for Local Storage and Export.

The aspect of maturity of plums and peaches intended for local storage or for export is of the greatest importance, because the quality of the fruit on ripening is determined by the stage of maturity at which the fruit is picked. The remarks stated hereunder do not apply to fruit which is partly grown, but only to fully grown fruit. Normally, fruits on the tree ripen very shortly after having stopped increasing in size. For storage purposes the fruit must be picked before it is ripe, but it is a matter of some difficulty to state exactly when.

It is not difficult to recognize three stages of maturity in fully grown but unripe fruit, which stages may be referred to as immature, semi-mature, and mature. With immature fruit, the flesh is hard and rather green. It is sour, lacking in juice, and most unpleasant to taste. The ground colour of the skin is green, and the flesh also has a greenish tinge.

With mature fruit, the flesh has lost its excessive hardness, but is not yet soft. Juice is just beginning to form, and on tasting, a slight development of flavour is noticeable, while the excessive sourness has given way to a slight sweetness. The flesh and ground colour have lost their greenness and have developed a whitish tinge, but have not developed the yellow of ripe fruit.

As the result of several season's work, the picking of plums or peaches in the immature stage is not recommended for local storage. Immature fruit actually stores longer at low temperatures than does mature fruit before disorders develop, but when ripening is attempted after storage, immature fruit fails to develop any flavour, although it may develop an appreciable amount of juice.

From an export point of view, a trade has developed in the shipping of plums. It is confined, however, to immature plums because they will store longer at 32° F. than mature plums before developing disorders, the difference being just sufficient to permit the export of immature plums, but not of mature plums.

So far as peaches are concerned, it is not recommended to export immature fruit, even if it arrives overseas without disorders developing. Such fruits when ripened are most deceptive. They may look excellent and possess fair juice,

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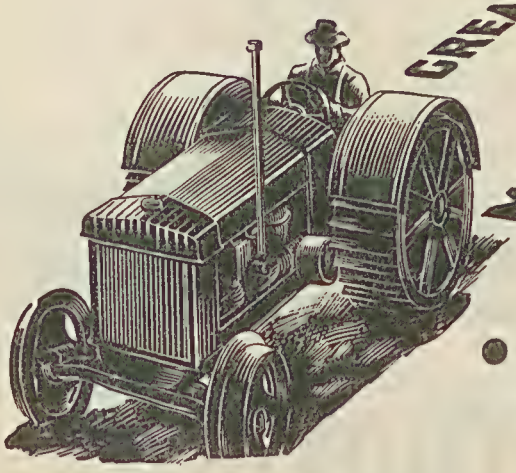

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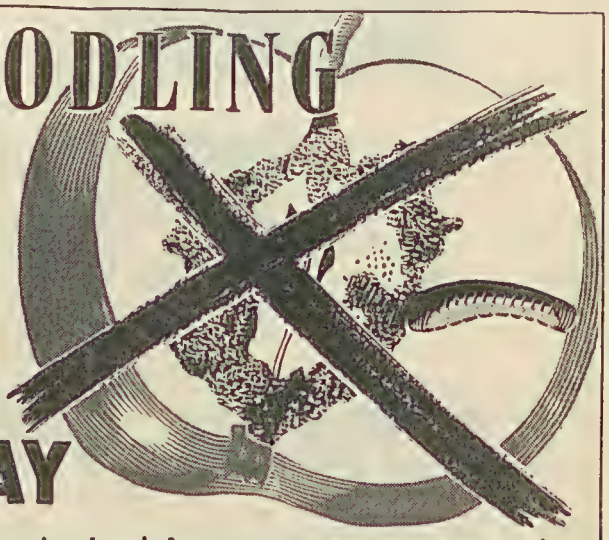

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but they are absolutely lacking in any peach flavour, and their sale could only lead to much dissatisfaction.

While growers and pickers are able to distinguish readily enough the three stages of maturity referred to above, the great difficulty is that each stage merges into the next, and hence it is difficult for a team of pickers to pick fruit all at the same stage of maturity. There will be wide divergences each side of that required. Hence it is most desirable to have some ready measure of maturity to which reference can be made as required. The ideal is some simple measure which the grower can use without recourse to chemical determinations.

From the investigational point of view, the measure of maturity is most important, so that the maturity of fruit obtained from year to year may be readily compared. The actual measures of maturity which have been adopted include the measurement of ground colour, the firmness of the flesh, the amount of blush, and the following chemical determinations—the soluble solids, the total amount of acid, the amount of ascorbic acid, and the catalase content.

TABLE VI.—MEASURES OF MATURITY FOR PEACHES.

Maturity.	Ground Colour.	Extent of Blush.	Pressure.
		%	lb.
Immature	2 (Pale green) ..	25	18
Semi-mature	2¾ (Green-yellow) ..	60	15
Mature ..	3¼ (Green-yellow) ..	80	11

The average ground colour, extent of blush, and firmness of flesh of several varieties of peaches over several years are set out in Table VI. for each maturity. The ground colour has been recorded by referring to Maerz and Paul's *Dictionary of Colour*, and colours 1, 2, and 3 correspond to plates 21L5, 21L3, and 21L1–2 respectively in this dictionary. The colour 2¾ means an intermediate stage between plates 2 and 3, but closer to plate 3 than to plate 2. Actually the advance in ground colour from the first to the third maturity is relatively small, and one has to rely much more on the development of blush and the slight softening which can be detected in more mature fruit. The varieties, however, vary considerably in the extent to which they blush as they mature. The Catherine Anne variety is usually the most highly blushed, and the Smith's variety the least. With each variety, season affects the percentage of blush and more particularly the amount of exposure to the sun, peaches completely shaded by foliage scarcely developing any blush at all. In Table V. the figures given for blush refer to the percentage of the surface of the fruit covered by blush, and as mentioned above is the average of several years' pickings.

The firmness of the fruit was measured by the standard U.S. Penetrometer which records the pressure in pounds necessary to force a 5/16 in. plunger to a depth of 5/16 in. into the flesh of the peach after removing the skin. The figures as recorded in Table V. for pressure are subject to variation according to variety and season.

Referring now to plums, it is found that several varieties are fully blushed (blue or red) when only partly grown, when the plums are quite unsuited for storage. Hence the development of blush cannot be used as a measure of maturity in the plum as it can in the peach. Measurements of the ground colour and pressure of the three stages of maturity have been recorded with plums, and they are set out in Table VII.

TABLE VII.—MEASURE OF MATURITY—PLUMS.

Maturity.	Ground Colour.	Pressure.
		lb.
Immature ..	1 (Green)	13
Semi-mature ..	2 (Pale green) ..	10
Mature	3 (Green-yellow) ..	8

Often the ground colour is completely obscured by the blush, in which case, it is possible to determine the colour of the flesh just beneath the skin. It has been found that the colour of the flesh is generally about half a stage more advanced than the ground colour of the skin.

The same chart cannot be used for the Japanese variety Satsuma because both flesh and skin are red at the three stages of maturity. The Japanese varieties, Wickson, Narrabeen, and Shipper, unlike the European varieties, do not develop blush until they are fully mature, and hence at the most suitable stage for picking. The tip of the plum is then showing the first tinge of red.

* The colour standards used in this paper are half a stage more advanced than the standards used in the previous paper (3), and correspond to colours 1½, 2½, and 3½ in that paper.

Chemical Determinations of Maturity.

As a measure of maturity at picking time, determinations of soluble solids (degrees Brix) and acidity of the juice have been made. Results obtained with peaches have been given in a previous paper[2], and have shown that the soluble solids increase, and the acidity decreases with advancing maturity. Further results obtained in 1937 are set out in Table VIII. Determinations were made of total soluble solids, total acid, ascorbic acid, and catalase, using two varieties of peaches, five varieties of European plums, and two varieties of Japanese plums.

The total soluble solids is an approximate measure of the sugar content of the juice. The determination was made by floating a Brix hydrometer in the juice. The total acid was determined by titration with standard alkali and expressed in terms of anhydrous malic acid.

Determinations have also been made of the concentration of easily reducible substances in the juice. Ten millilitres of the juice were titrated with O.01N iodine solution, and the result was calculated as percentage of ascorbic acid in the juice, as there is some evidence that this is the chief easily-reducible constituent of fruit juices[1].

Catalase is the enzyme which liberates free oxygen from hydrogen peroxide. The catalase content was determined as follows:—

The juice was neutralized during extraction with calcium carbonate; 5 mls. of the neutralized juice were shaken for 15 minutes at 68° F. with 5 mls. of normal hydrogen peroxide solution, and the catalase content expressed as mls. of free oxygen evolved.

In most cases the soluble solids increase with maturity. In the plums the acidity tends to fall with maturity, but with some varieties there

Table VIII.—Analysis of the Juice of Peaches and Plums at Picking, 1937.

Variety.	Date of Picking.	Maturity.	Soluble Solids (Brix).	Total Acid.	Ascorbic Acid.	Catalase (mls. of oxygen).
				%	%	
Zerbe Peaches	15.1.37	1st	9·0	1·28	·006	5·3
		2nd	12·2	1·17	·01	5·3
		3rd	13·5	1·09	·01	5·1
Wiggin Peaches	15.1.37	1st	8·4	1·19	·004	5·3
		2nd	9·0	0·98	·002	5·3
		3rd	10·7	0·86	·007	5·0
Grand Duke Plums ..	26.1.37	1st	12	1·11	·005	2·3
	4.2.37	2nd	12·4	1·05	·007	1·4
	24.2.37	3rd	..	1·08	·004	2·6
President Plums	4.2.37	1st	16·6	0·83	·012	2·4
	9.2.37	2nd	16·6	0·82	·006	4·1
	19.2.37	3rd	15·1	0·63	·003	4·2
Golden Drop Plums ..	26.1.37	1st	12·5	0·74	·015	6·0
	9.2.37	2nd	12·8	0·5	·012	13·8
	16.2.37	3rd	..	0·45	·015	12·2
Jefferson Gage Plums ..	15.1.37	1st	..	1·2	..	3·3
	22.1.37	2nd	..	0·95	·002	3·9
	22.1.37	3rd	..	0·83	·002	3·6
King Billy Plums ..	20.1.37	1st	13·9	1·78	·005	3·2
	28.1.37	2nd	17	1·79	·004	2·0
Wickson Plums	12.1.37	1st	10·7	1·48	·012	2·3
	18.1.37	2nd	11·7	1·48	·018	3·3
	18.1.37	3rd	13·9	0·94	·016	5·5
Satsuma Plums	12.1.37	1st	9·6	1·32	·013	5·9
	12.1.37	2nd	12·6	1·32	·021	4·7
	20.1.37	3rd	13·1	1·14	·016	5·5

is no appreciable difference in the acidity of the first and second maturities. It is probable therefore, that the acidity of plums starts to decrease only as they become semi-mature. The ascorbic acid content and the catalase content do not show any consistent relation to maturity. In general, the relation of these constituents to maturity is hardly close enough to warrant them being used as standards suitable for all varieties.

Fungal Rotting in Stored Peaches.

Quite apart from the problem of the storage of peaches so as to avoid the onset of storage disorders, there is a second and major problem to be overcome before peaches can be successfully stored. This major problem is the development of mould wastage not so much during storage, but more particularly during the period of ripening after storage. The fungus mainly concerned is the common brown rot (*Sclerotinia fructicola*), although at times Penicillium rots may be troublesome.

As the result of experience of several seasons' pickings, there is ample evidence that where brown rot infection is severe in the orchard, sound peaches picked from that orchard will most likely develop brown rot. On the other hand, where an orchard is free from the trouble, then there is little, if any, likelihood of brown rot developing in stored peaches from that orchard.

Apparently, then, in the former case, the peaches at picking time are either already inoculated, but the inoculation is not visible, or the peaches are heavily dusted with the mould spores, which ultimately germinate and attack the fruit.

If the peaches are already inoculated, then of course brown rot development is inevitable, and no storage practice can prevent it. Where the peaches are heavily dusted with spores, but not inoculated, the control of storage humidity may be of considerable importance. A high humidity around the fruit would favour spore germination and infection. It was thought that the type of wrapper might have some influence on the humidity around the fruit, and hence possible infection, and a wrapper test was carried out, therefore, during 1938.

Five varieties of peaches were stored in both air and gas storage (8 to 10 per cent. carbon dioxide), the peaches being removed at intervals from storage and ripened at 45° F. The peaches were packed in trays holding approximately 30 fruits. In some trays the peaches were not wrapped, in others they were wrapped in ordinary sulphite wrappers, while in others they were wrapped in waxed wrappers. The amount of fungal rotting which developed in the various wrapping treatments is set out in Table IX. The results do not disclose any significant difference between air storage and gas storage so far as fungal rotting is concerned, nor was there any significant difference between no wraps and plain wraps, or between no wraps and wax wraps. There is a decrease in the percentage of rotting in fruits wrapped in waxed wraps as compared with plain wraps, the difference being significant at the 5 per cent level. However, the results taken as a whole are such that no control of rotting can be expected by the use of the above wraps.

TABLE IX.—THE EFFECT OF GAS STORAGE AND WRAPPERS ON THE DEVELOPMENT OF FUNGAL ROTTING IN PEACHES STORED IN TRAYS.

Variety.	Weeks at 32° F.	Days at 65° F.	Percentage Rotting.			
			Air Stored.			Gas Stored.
			Unwrapped.	Plain Wraps.	Waxed Wraps.	Plain Wraps.
Zerbe ..	4	2	..	22	..	44
„ ..	6	3	..	11	..	30
„ ..	8	0	..	26	..	59
Hooker ..	4	2	..	87	..	47
„ ..	6	3	..	47	..	53
„ ..	8	2	..	80	..	77
Smith's ..	4	3	..	4	..	4
„ ..	6	0	..	4	..	30
„ ..	8	0	..	7	..	63
Catherine Anne	5	0	3	12	18	12
„ „	7	0	9	39	24	48
„ „	9	0	12	55	24	55
Late Crawford	4	0	67	33	15	48
„ „	6	0	45	52	18	15
„ „	8	0	79	42	33	52

Respiration during Cool Storage and Ripening.

In studies of cool storage, the respiration of the fruit is often used as an index to the metabolism. The rate of production of carbon dioxide has been measured in this work. The respiration of individual fruits was measured by enclosing each fruit in a glass shell and drawing over it a stream of air previously freed from carbon dioxide by passing over soda lime. The air stream picks up the carbon dioxide respired by the fruit and is then drawn through Pettenkoffer tubes containing a definite amount of standard barium hydroxide solution, which absorbs the carbon dioxide respired by the fruit. The carbon dioxide is then estimated by titration.

The respiration of the typical fruits of Catherine Anne peaches at 32° F., 45° F., and 55° F., is plotted in Fig. 1. At each temperature the respiration rises initially to a maximum and then falls. This peak of respiration is known as the climacteric. At 55° F. the fruit becomes ripe (indicated by R) just before the climacteric, and starts to become overripe (indicated by O) practically at the climacteric. Finally, as the fruit loses its palatability and becomes more definitely overripe, the respiration again rises.

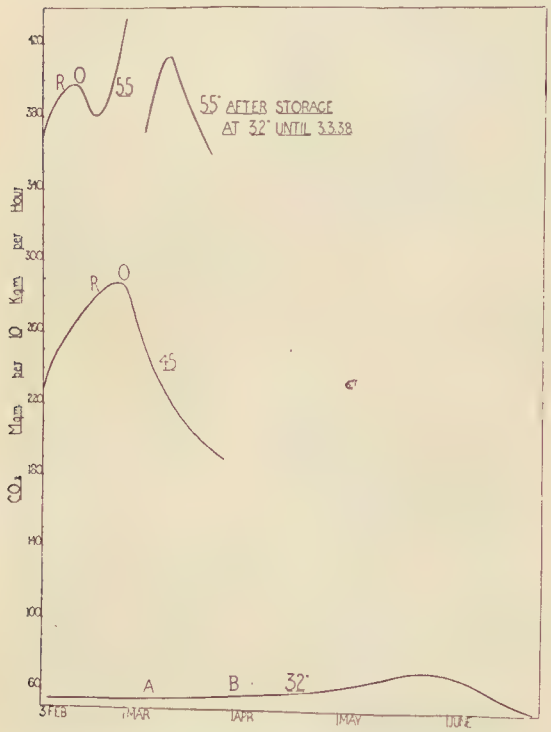

Fig. 1.—The effect of temperature on respiration of Catherine Anne peaches.

At 45° F. the rate of respiration is much less and the climacteric occurs later, but the fruit passes through a similar sequence of changes, except that there is no evidence of a final rise in respiration. At 32° F. the respiration is considerably reduced, and the climacteric is flattened and occurs very much later (after about three and a half months). As has been already stated, the peaches do not ripen at this temperature, but must be removed to higher temperatures for ripening. Catherine Anne peaches must be removed from 32° F. not later than point A if they are to ripen normally at 45° F., while if they are to ripen at 55 F°. they can be kept at 32° F. for a little longer (up to point B). The second respiration curve at 55° F. is that of a peach which was removed from 32° F. on 3rd March and ripened normally at 55° F.

Similar respiration curves for Late Crawford peaches are given in Fig. 2. A similar respiration curve is obtained at 55° F., but the peaches are not fully ripe until they have reached the climacteric, and start to become overripe only when they have passed the climacteric. Both at 55° F. and 45° F. the respiration finally rises as the peaches become definitely overripe. At 32° F. the rise towards the climacteric and subsequent fall is barely perceptible.

The respiration of typical fruits of King Billy plums at 32° F., 37° F., 45° F., and 55° F. is plotted in Fig. 3. At 55° F. the respiration rises rapidly to the climacteric, and subsequently falls rapidly. Unlike the peaches, the plums do not become fully ripe (indicated by R) until well past the climacteric. At 45° F. a similar curve is obtained, but ripening and the rise towards the climacteric is delayed. At 37° F. and 32° F. the respiration is

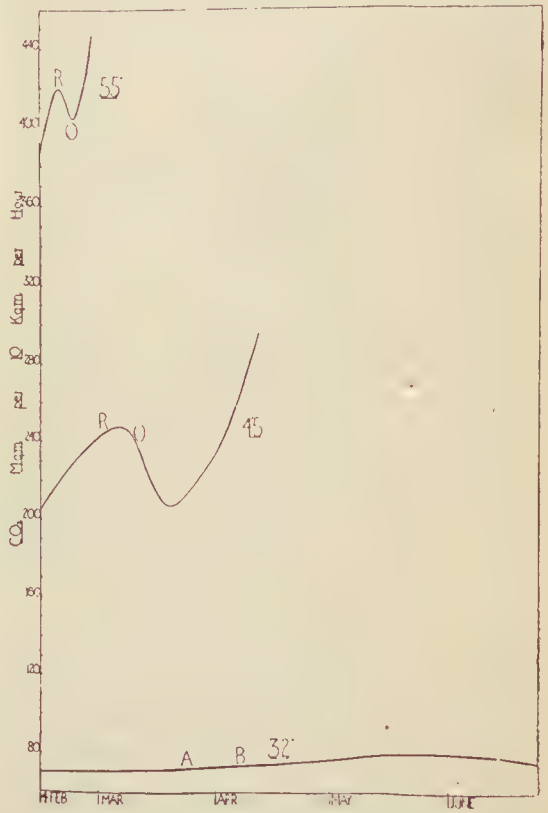

Fig. 2.—The effect of temperature on respiration of Late Crawford peaches.

still further reduced, and the climacteric is delayed being reached only after two months at 32° F. At the lower temperatures ripening does not occur, but King Billy plums must be removed from 32° F. at the point A, if they are to ripen normally at 45° F. (As King Billy plums did not give any appreciable difference in the storage life at 32° F., whether ripened subsequently at 45° F. or 55° F., points A and B are practically the same on this curve).

The second respiration curve at 55° F. is that of a King Billy plum which was removed from 32° F. on 10th February and ripened normally. In a subsequent removal on 2nd March the plums (third respiration curve at 55° F.) did not ripen normally. No evidence of a final rise in the respiration of King Billy plums was obtained at any temperature.

Similar curves for Wickson plums are given in Fig. 4. At 32° F., 37° F., and 45° F. the respiration falls after the climacteric and finally rises again. The Wickson are similar to the King Billy plums in not becoming fully ripe until past the climacteric

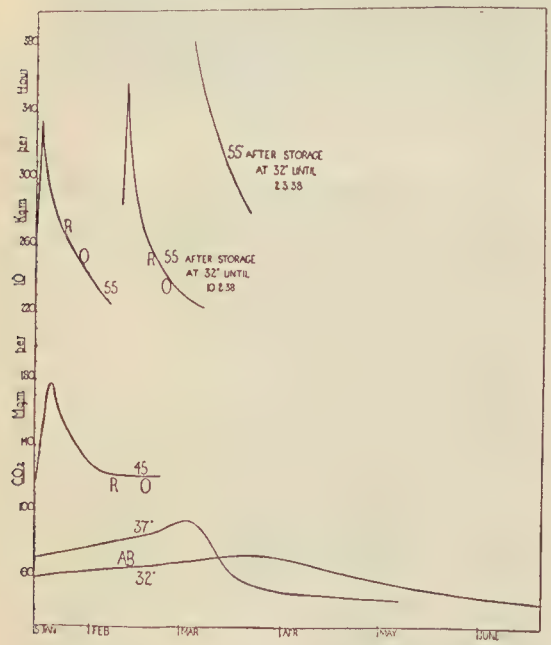

Fig. 3.—The effect of temperature on respiration of King Billy plums.

At 32°–37° F. ripening does not occur. Wickson plums can only be kept at 32° F. until point A if they are to ripen normally at 45° F., and until point B for normal ripening at 55° F.

When we consider the respiration curves for the peaches and plums as a whole, we see that in some cases the fall after the climacteric is followed by a subsequent rise, but in other cases no evidence for the final rise is obtained. The two types of curves occur without any apparent regularity.

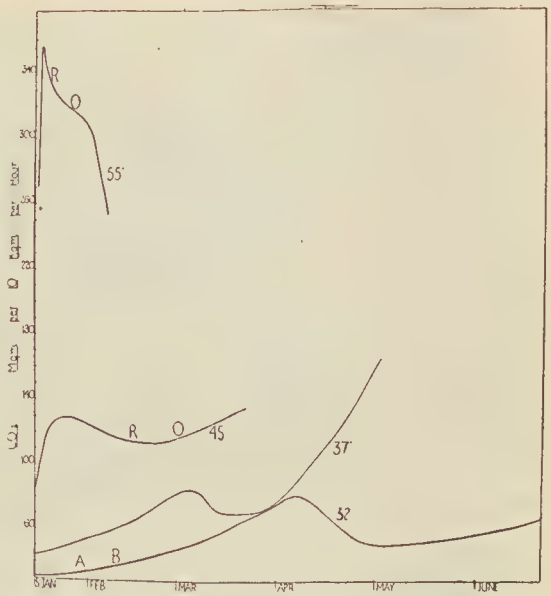

Fig. 4.—The effect of temperature on respiration of Wickson plums.

Summary.

Neither for local storage nor for export is the picking of immature plums and peaches recommended. Such fruit is quite hard and green and very sour.

In mature plums and peaches, which develop maximum juice and flavour on ripening, the flesh and ground colour have changed to a whitish green, and very slight softening has occurred. Mature plums give a pressure test of about 8 lb., and mature peaches about 11 lb.

Mature peaches can also be distinguished by the high development of blush, but plums cannot be distinguished in this way, as some blue and red varieties are fully blushed when only partly grown.

The juice of mature plums and peaches is higher in soluble solids and lower in total acid content than that of immature fruits. There was no significant difference with maturity in the iodine titration or the catalase content of the juice.

The storage life at 32° F. is limited by disorders which develop after removal to ripening temperatures while, at the minimum ripening temperature, it is limited by overripeness.

It has been found that mature plums can be kept for a considerable period by storing initially at 32° F. and then transferring to the minimum ripening temperature, which varies from 40° F. to 46° F., according to the variety. The storage life obtained by this means was much greater than that which could be obtained by the use of either temperature alone, and varied from eight weeks with the Satsuma plum up to eighteen weeks with the Cole's Golden Gage.

If higher ripening temperatures were used, the maximum period at 32° F. was increased, but the time to ripen was reduced, and the total storage life was very nearly the same.

Similar results have been obtained with mature peaches, the minimum ripening temperature varying from 45° F. to 55° F. according to the variety.

The control of fungal rotting of peaches in storage (particularly that due to brown rot) is primarily attained by reducing infection in the orchard, and rotting has not been controlled satisfactorily in storage when the fruit was obtained from affected orchards.

At 45-55° F. peaches are fully ripe when they have reached the climacteric of respiration, but plums do not become fully ripe till much later. The storage life at 32° F. is not more than half the time necessary to reach the climacteric.

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Manurial Requirements of Potatoes

Continued from Page 604

Upon analysis, the tubers from a 6-ton potato crop have been found to contain a total of 67 lb. nitrogen, 77 lb. potash, and 24 lb. of phosphoric acid. This means that a 6-ton crop takes from the soil the approximate equivalent of 3¼ cwt of sulphate of ammonia, 1½ cwt. sulphate of potash, and a little more than 1 cwt. of superphosphate. From this it will be seen that the drain on the soil elements made by the crop is greatest on potash. It should be noted that the above figures give merely the amounts of the three principal elements removed by the tubers of a 6-ton crop. It is probable that much greater quantities of each are necessary in the soil for the development of this yield. The actual chemical content of the tuber portion of the crop, therefore, can not be accepted as a guide in estimating the quantity of manure required to produce it.

Following the publication of the results obtained from the various manurial trials and the resultant demand from potato growers, the major fertilizer companies have made available in recent years certain compound manures which embody the recommendations made by the Department of Agriculture. The most important of these compounds are superphosphate and sulphate of ammonia, mixed in the proportions of 6 : 1 and 3 : 1, which are now well known and widely used by Victorian growers.

The recommendations for the various districts in which experiments have been conducted, together with the average yields obtained over the period of the tests, are summarized in the accompanying table. These recommendations also apply to other districts where the soil and climatic conditions are similar to those mentioned.

Pyramid Hill Irrigated Pasture Competition

Continued from Page 601

been graded and regularly check-banked on the border system, bays 16 yards wide and 9 chains long. Japanese millet was put in as a preliminary crop, afterwards the land lay in bare fallow and was sown in autumn of 1935 with 10 lb. of subterranean clover and 1 cwt. of superphosphate. In the second year, the rye grass was dominant, but now there is a good mixture of both elements. Every year Mr. Malone top-dresses with 1 cwt. of manure. The pasture has carried 170 ewes and lambs at intervals for a month at a time.

By J. L. Provan, B.Agr.Sc., Senior Horticultural Instructor.

Orchard Notes.

DURING early December, the late varieties of cherries, viz., Reine Hortense, Big. Napoleon, Florence and St. Margaret will mature, and loganberries, cherry plums and early dessert peaches will be harvested. These fruits will be followed by Pickering, Anzac and Hale's peaches, and apricots. If the present dry weather conditions continue, brown rot of the stone fruits is not likely to be prevalent, but where this disease has been troublesome in the past, a wettable sulphur spray, 4 lb. in 100 gallons, can be applied to dessert peaches, but not within fourt een days of picking. If later treatment is required to prevent brown rot of peaches or cherries, an ammonium polysulphide spray, one gallon in 80 gallons of water, plus 3 lb. of soft soap, can be applied. For late canning peaches, if a dry-mix lime sulphur spray (25 lb. in 100 gallons) was not applied at the end of November, it may be applied early this month. Unfortunately, no cover sprays for the control of brown rot of apricots are available; sprays containing copper or sulphur will cause severe injury to the fruit.

Some growers have been experiencing arsenical injury to foliage and fruit, due to soluble arsenic being formed. Occasionally this trouble has occurred where lead arsenate sprays only have been used, and in other cases where combination sprays have been applied. The registration and standardization of lead arsenates have protected the grower from the possibility of buying arsenates containing a dangerous percentage of soluble arsenic, but in some cases, the water which is used for the spray may frequently cause the formation of soluble arsenic, which, in turn, causes a browning and shrivelling of the leaves, particularly at the edges. Injury to the fruit usually takes the form of an irregular, depressed, dark, purplish area. Frequently, this area is crescent shaped as if it occurred on the margin of a blotch of spray. In some districts, the scarcity of spraying water, this season, has caused growers to turn to other sources of supply than those normally used. Such unknown sources of supply should be adopted cautiously, because the water may contain a dangerous amount of soluble mineral salts, such as chlorides and sulphates, which in combination with lead arsenate, give rise to the formation of soluble arsenic. If the water tastes brackish it should not be used for spraying purposes. If growers have any doubts about the water supply, a sample can be

forwarded to the Agricultural Research Chemist, State Laboratories, Gisborne-street, Melbourne, C.2, for analysis. Forward about one quart of water in a clean bottle. The sample should be accompanied by a sum of 5s., which is the fee for this analysis. Label the bottle clearly with the the name and address, and particulars of sample.

Combination sprays of lead arsenate and white oil emulsions sometimes cause a small amount of arsenical injury on foliage and fruit. This appears to be associated with the use of certain emulsifiers in the manufacture of the white oil sprays. Frequently, in such combination sprays, the addition of a lime casein spreader will reduce injury, but only a small amount should be used, otherwise the insecticidal efficiency of the lead will be impaired because of excessive "run-off" from the surface of the fruit. Soaps should not be combined with arsenate of lead.

December is a very important month in the fruit tree's life history. It is during this month that a proportion of the buds commence the differentiation of their blossom primordia. Some varieties of apples commence this change in December, while in other varieties it is delayed until early January. William's pear buds commence their initiation early in December. If these blossom primordia are well nourished during their early development, then the first steps have been taken in securing a good crop for the subsequent season. Care, of course, should be taken not to over-stimulate the trees at this period because new growth, formed later, will use up food reserves which should nourish developing blossom buds.

Citrus trees which were sprayed with Bordeaux mixture in the spring, for the control of Anthracnose and Septoria, should not be fumigated early in the season. In some cases fumigation, even six months after the application of Bordeaux mixture sprays, has caused damage to the trees. Defoliation and twig burn, with scalding of the fruit are the usual symptoms of this injury.

The continued dry weather is likely to favour the spread of red spider, and growers should watch the spread of this pest very carefully. The addition of one pint of nicotine sulphate to the arsenate of lead sprays (5 lb. of paste in 80 gallons of water) or the white oil spray (1¼ gallons of white oil emulsion in 80 gallons) will effectively control red spider if care be taken to direct the spray to the underside of the leaves. This spray will also provide efficient control of the apple leaf hopper in the Stanley and Harcourt districts.

Chemical or hessian bands should be placed around the trunks of apple and pear trees to assist in the control of codling moth. The former have the advantage that once they are in place they require very little subsequent attention. The latter will require inspection about every ten days, so that the sheltering larvae and pupae can be destroyed. Before the bands are placed in position all other forms of shelter such as loose bark and rubbish in the forks of the trees should be removed. It is advisable, once or twice in the season, to examine occasional chemical bands to ascertain whether any moths are emerging from them. If the emergence of moths, as shown by empty pupae cases, does not exceed 2 or 3 per cent. they can be regarded as efficient, but where this number is exceeded then a careful examination should be made of some of the remaining bands. It may be necessary to replace bands which are allowing moths to emerge from them.

The Flower Garden.

By A. W. Jessep, M.Agr.Sc., B.Sc., Dip. Ed., Principal, School of Horticulture, Burnley.

THE majority of summer annuals should be planted and well established before the arrival of the very hot summer months. It is not, however, too late for making further sowings of Antirrhinum, Carnation, Cosmos, Gaillardia, Kochia, Giant French Marigold, Portulaca, Sunflower and Zinnia.

Gladioli for bloom in February and March should be planted this month. It is also advisable to plant Dahlias now; they will then not flower until the hottest months of the year are over and the blooms will last much longer than those from tubers planted earlier. Flag Iris, Nerine, and Hyacinth may also be planted out now.

The Flag Iris has been flowering during the last six weeks, and is well worth growing in gardens with ample space. The flowers are beautiful, and if the faded blooms are removed, the same spike will last for two or three weeks. Flag Irises may be obtained in a wide range of colours, and the spikes vary in height from one to three or four feet. When planting, the smaller varieties should be placed in the front of the bed, with the tallest at the rear. If given a suitable position,

they are easy to grow, and require little attention. They succeed best in a well-drained soil, in a sunny position sheltered from the prevailing winds.

The preparation of the soil is simple. Dig it over, and if it is very wet, drain it by raising the bed above the level of its surroundings. Unless the soil is poor, fertilizers are unnecessary; under no circumstances should stable manure be used. If the soil is of poor quality, add about 2 oz. of superphosphate per square yard, and lightly fork it under. Heavy soils require a good dressing of lime during the winter months.

The method of planting is very important. The fleshy root portion (the rhyzome) should be no more than just covered with soil. It is better to leave it a little above the ground rather than plant it too deeply. If a bed is set apart for them, the sizes may be arranged and colours blended. In order to leave room for the rhyzomes to develop, plant them about 18 inches apart each way. If in groups, place the rhyzomes about a foot apart and leave a space of not less than 2 feet between each group. It is best to use only the one variety in each group. The clumps should be lifted and divided every three or four years, and the best and strongest rhyzomes selected for replanting. If this is done, they should produce masses of exquisite blooms in many glorious shades of blue, yellow, bronze, white, pink, and almost red. The only cultivation necessary is the keeping of the area free of weeds by hoeing; this should be done very lightly owing to the nearness to the surface of the roots.

Too much watering is not advisable, but if the soil is very dry, water it well before and during the flowering period. Irises require very little water after flowering as a dry period suits them. If any leaves die off, pull them and burn them; do not cut them, as the stump left would be liable to rot.

There is a very wide selection obtainable and with the exception of the newest varieties, all are relatively cheap. However, price is not a true indication of quality, as some of the most beautiful cost very little. The price is largely a matter of supply and demand. With the new varieties, there is usually a scarcity of rhyzomes for sale, and the price consequently is high.

It is difficult to give true worth to the colourings by description. The best plan is to inspect the Iris gardens personally and make a choice for oneself. The following are good standard varieties:—

Blue Tones.—Anne Page, El Capitan, Lady Foster, Azurine, Alcazar, and Duke of Bedford.

Pink Tones.—Dream, Rhea, Coppersmith, Magnifica, Red Riding Hood, and Isolene.

Reddish-brown Tones.—Ambassadeur, Cheyenne, Cinnibar, Homer, Indian Chief, Magenta, Solferino, and Pioneer.

Yellow Tones.—Autumn Glow, Rialgar, Eldorado, Helea and Flaming Sword.

A decorative dahlia.

Vegetables.

Summer is the time for salads; therefore a plentiful supply of greens should be available from the vegetable garden. Make further plantings of lettuce, beetroot, cucumber, pumpkin, French beans, egg plant, pea and carrot. Also plant out summer cabbage, cauliflower, celery and tomato.

Hoeing and hosing are both important during the summer. A thorough soaking of water once or twice a week is more beneficial than a daily sprinkling. After watering, as soon as the soil is dry enough, the surface should be hoed. If there is any available straw material, place it on the hoed area. It is useful for retaining the

moisture by breaking the direct rays of the sun from the soil surface. If the plants are not making sufficient progress, give them a dressing of market garden manure at the rate of about 2 oz. per square yard. The application should be followed by a good watering.

If tomatoes are planted in December, they should be finished fruiting before any frosts. It has been observed that late plantings are not so susceptible to tomato wilt as are the earlier. Select well grown seedlings and plant them out in rows 3 feet apart, leaving about 3 feet between each plant. In order to obtain a good clean tomato, it is better to stake each plant with a 5-ft. stake. The young plant will require weekly attention as soon as it shows signs of making active growth. The side shoots should be removed, and when the leader has attained a height of about 1 foot, tie it to the stake. When the plants are about 4 feet high, the top shoot should be nipped off; this enables them to set and ripen fruit more quickly. There are several different ways of growing tomatoes; what is desired is a plant whose fruit will not droop to the ground and one whose branches can be thinned as required.

Varieties.—There is a very large number of varieties on the market at the present time, and a description of some of them may be obtained from an article in the October issue of this *Journal.*

The most satisfactory varieties for household purposes are those with smooth skins and a large percentage of solids. A selection may be made from the following:—Eccles Surprise, Kondine Red, Market King, Recruit, Early Sunrise, and Maori Chief. San Mazano is a good one for sauce-making, but it is not suitable for the table.

If the plants are not getting away well, give them a dressing of sulphate of ammonia at the rate of about 2 oz. per square yard. It should be distributed evenly over the bed and followed by a thorough watering. On soils of average quality, a dressing of market garden manure at the rate of 1 lb. to every seven or eight plants should give satisafctory results. Tomatoes require a period of about four months from the time of planting until the fruit is ready for harvesting.

All-Australian Export Baconer and Porker Carcass Competitions

Entries close 15th April, 1939.

THE Australian Meat Board has announced that the All-Australian Export Baconer and Porker Carcass Competitions will be continued during next year when judging will be held in London in June. Entries for this series will be due at Australian Works on 15th April, 1939.

The Competitions were started mainly to provide a means of acquainting Australian pig raisers with the requirements as to type and conformation of the United Kingdom market, the only overseas outlet for our surplus pork. Australia's share of that market has increased steadily over recent years and to enable us to continue to compete it is essential that the requirements of United Kingdom consumers should be met. Prices are at present very good for the Australian supplier and, as supplies are regulated, are likely to remain so.

Carcasses entered for the Competitions are judged in London according to a system of measurements and photographs devised by Dr. John Hammond and other English authorities. Marks are awarded for various features such as body length, leg length, hams, shoulders, &c., and a full list of these marks is supplied to each entrant to enable him to see how far and in what respects his pigs fall short of the ideal.

Apart from the prospects of success in winning a prize—a sum of £25 is distributed in prizes in each section—the Competitions thus offer a valuable service to all entrants.

Entry forms may be obtained from Works which treat pigs for export, from the Department of Agriculture, and the Veterinary Officers of the Commonwealth Department of Commerce in each State, and from the office of the Board at 401 Collins-street, Melbourne, C.1.

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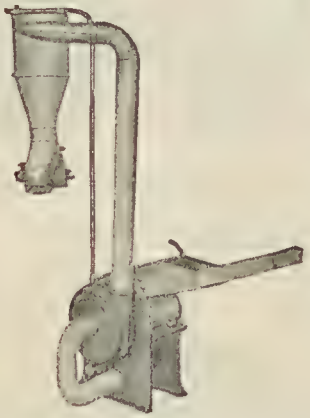

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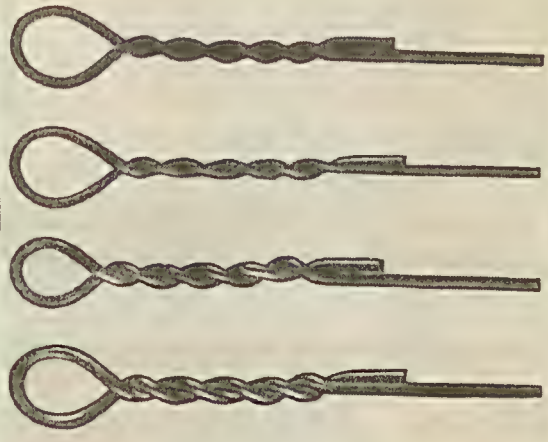

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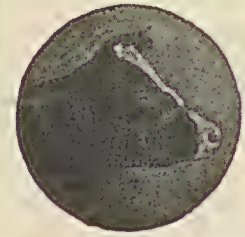

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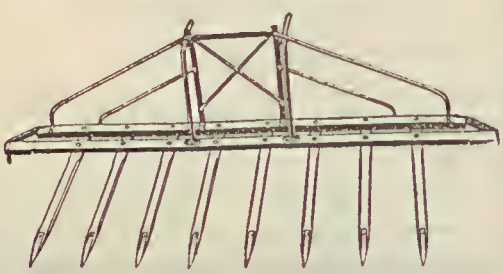

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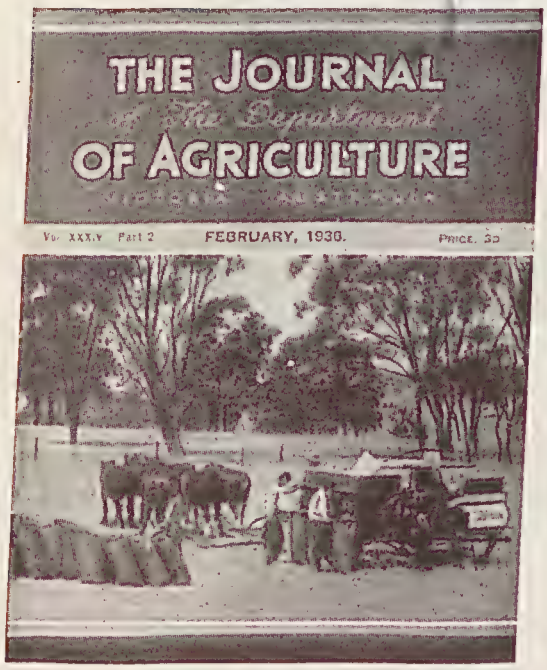

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DEPARTMENT OF AGRICULTURE

VICTORIA, AUSTRALIA

STANDARD HERD RECORDS

For Quarter Ending September, 1938

14183.

Standard Herd Records

For Quarter ended 30th September, 1938

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 384, of which 252 qualified for the certificate. The figure in brackets after the owner's name shows the number of entries.

The amount of butter fat required for qualification varies with the age class to which the animal belongs, the standard being as follow :—

Junior 2 year old (under 2½ years at time of calving)	230 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving) ..	250 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving) ..	270 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving) ..	290 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving) ..	310 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving) ..	330 lb. butter fat.
Mature cow 5 years and over	350 lb. butter fat.

(Except where otherwise stated, the period of Test was 273 days.)

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Alston, N. B., and Sons, Romsey, Jersey (9).										
Rosyth Bonnie Maid ..	50496	20.10.37	11½	6,504	4·87	316·95	350	Mature	249, 283, 314	Aveley Antony
Rosyth Brown Eyes ..	50497	15.11.37	14½	5,474	5·34	292·45	350	Mature	229, 258, 260	Aveley Antony
Rosyth Gay Brownie ..	59332	21.10.37	11	4,841	6·09	294·67	250	Sr. 2	192 ..	Werribee Gay Piece
Rosyth Gay Grevillea ..	55120	6.12.37	16	7,038	5·06	355·87	310	Jr. 4	290, 321 ..	Werribee Gay Piece
Karoonda Golden Daffodil	Vol. 25	5.12.37	11½	3,170	5·20	164·73	230	Jr. 2	.. ..	Rosyth Peter Pan
*Rosyth Grevillea ..	46068	10.10.37	4	5,790	5·24	303·18	350	Mature	250, 300, 302, 315	Aveley Antony
Rosyth Princess Rosalie ..	50505	29.9.37	10½	7,717	4·49	346·47	350	Mature	256, 337, 348	Aveley Antony
Rosyth Rosebud ..	46073	28.9.37	11½	6,717	5·12	344·07	350	Mature	246, 290, 399, 319	Aveley Antony
Rosyth Sweetbread ..	50506	26.12.37	17½	5,660	5·29	299·50	350	Mature	235, 264, 291	Aveley Antony
Atkinson, W. K., Swan Hill, Dairy Shorthorn—(29).										
*Willow Park Butterfly 8th	D.S.H.B.	29.11.37	4	4,680	3·56	166·80	230	Jr. 2	.. ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Camelia 6th ..	D.S.H.B.	5.10.37	12½	9,459	3·57	337·93	350	Mature	358, 314, 371, 344	Willow Park Design
Willow Park Camelia 9th ..	D.S.H.B.	16.10.37	21	9,402	4·25	399·64	350	Mature	347, 393, 360	Willow Park Imperial 3rd
Willow Park Camelia 14th	D.S.H.B.	7.11.37	18	8,018	3·61	289·77	270	Jr. 3	241 ..	Wicklesham Lord Barrington 5th (Imp.)
†Willow Park Camelia 16th	D.S.H.B.	30.9.37	..	8,160	3·68	299·97	230	Jr. 2	.. ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Comet 7th ..	D.S.H.B.	22.10.37	29½	12,996	3·59	466·97	350	Mature	284, 378, 446, 497, 425	Willow Park Design
Willow Park Comet 14th ..	D.S.H.B.	27.9.37	17	9,600	3·97	381·10	270	Jr. 3	290 ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Countess 4th	D.S.H.B.	5.11.37	7½	9,798	3·83	375·57	350	Mature	283, 364, 399, 380, 381, 449, 431, 389	Willow Park Revenue
Willow Park Countess 9th	D.S.H.B.	1.12.37	23	11,369	4·06	462·63	350	Mature	396, 489, 443, 476	Willow Park Imperial 3rd
Willow Park Countess 13th	D.S.H.B.	25.11.37	18½	9,740	4·00	389·31	310	Jr. 4	323 ..	Willow Park Lustre 3rd
Willow Park Countess 15th	D.S.H.B.	1.11.37	20	10,382	3·73	387·11	310	Jr. 4	319 ..	Willow Park Silvermine 4th
Willow Park Countess 18th	D.S.H.B.	7.11.37	15½	7,590	3·99	303·19	270	Jr. 3	230 ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Dainty 8th ..	D.S.H.B.	9.12.37	25	10,572	4·13	437·09	350	Mature	301, 392 ..	Willow Park Sherlock
Willow Park Dainty 12th ..	D.S.H.B.	29.9.37	17	9,686	3·70	358·59	270	Jr. 3	275 ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Damsel 3rd ..	D.S.H.B.	4.12.37	28½	11,109	4·19	464·92	350	Mature	382, 430, 470	Willow Park Imperial 3rd
Willow Park Damsel 4th ..	D.S.H.B.	29.11.37	6	9,848	3·50	345·01	310	Jr. 4	257, 369 ..	Willow Park Lustre 3rd
Willow Park Damsel 6th ..	D.S.H.B.	4.10.37	11	5,586	3·90	218·03	230	Jr. 2	.. ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Duchess 15th	D.S.H.B.	8.11.37	16	8,933	4·11	366·75	350	Mature	261, 352, 351, 353, 356	Willow Park Eminent
Willow Park Duchess 19th	D.S.H.B.	21.11.37	16½	11,909	3·85	458·97	350	Mature	403, 442, 411	Willow Park Governor
Willow Park Duchess 26th	D.S.H.B.	19.11.37	13	9,989	4·30	429·13	310	Jr. 4	300, 364 ..	Willow Park Imperial 3rd
Willow Park Duchess 28th	D.S.H.B.	12.10.37	15	7,709	3·92	302·14	270	Jr. 3	239 ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Duchess 30th	D.S.H.B.	5.10.37	26½	10,164	3·75	380·87	230	Jr. 2	.. ..	Wicklesham Lord Barrington 5th (Imp.)

* 240 days in test. † 240 days in test (withdrawn sickness).

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Atkinson, W. K. Swan Hill—*continued.*										
Willow Park Melba 4th ..	D.S.H.B.	22.11.37	16½	11,174	3·97	443·14	350	Mature	333, 285, 362, 394, 480, 435, 500	Willow Park Sovereign 2nd
Willow Park Melba 14th ..	D.S.H.B.	20.11.37	21½	9,603	4·02	385·91	350	Mature	294 ..	Willow Park Silvermine 4th
Willow Park Melba 15th ..	D.S.H.B.	31.10.37	19	10,175	4·39	446·42	330	Sr. 4	414, 426 ..	Willow Park Lustre 3rd
Willow Park Melba 19th ..	D.S.H.B.	20.10.37	18½	8,979	3·61	324·02	310	Jr. 4	287 ..	Willow Park Silvermine 4th
Willow Park Queenie 33rd	D.S.H.B.	9.10.37	8½	8,682	3·78	327·83	310	Jr. 4	289, 363 ..	Willow Park Imperial 3rd
Willow Park Queenie 36th	D.S.H.B.	17.10.37	19	8,292	3·70	306·56	250	Sr. 2	.. ..	Willow Park Count 7th
Willow Park Ruby 7th ..	D.S.H.B.	8.11.37	20½	7,271	4·19	304·61	230	Jr. 2	.. ..	Willow Park Silvermine 8th
Austin, F., Lara, Jersey (2).										
Avalon Noble's Daisy 2nd	32907	10.10.37	16½	7,662	5·69	435·94	350	Mature	450, 542, 520, 538	Noble of Avalon
Avalon Noble's Duchess 4th	51559	30.9.37	13	6,629	5·62	372·58	270	Jr. 3	.. ..	Noble of Avalon
Ballarat Orphanage, Ballarat, Jersey (7).										
Orphanage Audrey's Molly 2nd	41398	14.11.37	17	8,586	4·49	385·86	350	Mature	290, 262, 458	Wompini V C.
Orphanage Handsome 2nd	Vol. 25	20.12.37	11	5,816	5·42	315·50	310	Jr. 4	.. ..	Orphanage Pride
Orphanage Lady 5th ..	58817	18.12.37	22	6,396	5·31	339·41	270	Jr. 3	.. ..	Retford King Bracken
Orphanage Maud ..	41404	5.11.37	13	6,705	5·56	372·63	350	Mature	315, 420 ..	Orphanage Quicksand's Prince
Orphanage Quicksand 4th ..	49977	9.10.37	26	8,403	5·17	434·40	330	Sr. 4	394 ..	Jerseylea Quality Boy
Orphanage Quicksand 5th	58825	1.12.37	20	6,987	4·97	347·37	310	Jr. 4	346 ..	Banyule Silverstone
Orphanage V.C.'s Molly 3rd	54581	30.10.37	21½	7,493	4·80	359·65	310	Jr. 4	332 ..	Orphanage V.C.'s Trooper
Bassett-Smith, C., Kyabram, Red Poll (2).										
*Temperley Air Star ..	4841A	2.11.37	4	7,217	4·07	294·06	330	Sr. 4	226, 348 ..	Temperley Bright Star
Temperley Double Dorcus	A.A.C.R.	9.10.37	4	5,255	3·71	195·00	270	Jr. 3	.. ..	Temperley Dairyman
Biggar, R., Monomeith, Jersey (2).										
Myamyn Letitia 6th ..	Vol. 25	29.9.37	10½	4,652	4·43	206·24	230	Jr. 2	.. ..	Walora Park Air Lad
Walora Park Letitia 3rd ..	51058	28.9.37	11½	5,975	4·27	255·09	310	Jr. 4	319 ..	Glenavon Diana's Prince
Black, Estate of Late Mrs. A. J., Noorat, Jersey (1).										
Noorat Sunshine Susie ..	54485	26.9.37	16½	6,785	5·34	362·60	270	Jr. 3	.. ..	Banyule Lord Silvair
Black, I. S., Noorat, Ayrshire (2).										
Mount Noorat Alert 3rd ..	28719	17.10.37	N.O.C.	5,700	4·58	260·90	270	Jr. 3	277 ..	Gowrie Park Scottish Patron
Mount Noorat Pyrene 6th ..	28723	27.10.37	21	6,315	4·91	309·83	270	Jr. 3	.. ..	Gowrie Park Scottish Patron
Box, Estate of Late Dr. J., Whittlesea, Jersey (3).										
Edmonton Chevy.. ..	33210	4.10.37	11½	8,501	5·57	473·89	350	Mature	328, 464, 501, 492, 378, 487	Big Chief of Glen Iris
Toorongo Lady's Pet ..	Vol. 25	10.11.37	18	5,774	5·96	344·04	230	Jr. 2	.. ..	Staghorn Lord Aldan 3rd
Toorongo Princess Mona ..	50904	31.10.37	15	8,189	5·42	443·76	330	Sr. 4	319, 363 ..	Kantara Don Juan
Broad, Estate of Late A. A., Sutton Grange, Jersey (3).										
Grangelea Pretty Roseleaf 3rd	57543	14.12.37	21½	5,300	6·11	323·69	230	Jr. 2	.. ..	Grangelea Cream Boy
Grangelea Rosebud 7th ..	48527	22.10.37	18	6,023	5·76	347·12	310	Jr. 4	279, 374 ..	Banyule Macon
Grangelea Velveteen 2nd ..	53027	6.10.37	18	5,997	5·18	310·72	250	Sr. 2	294 ..	Banyule Macon
Butcher, F. T., Murraydale, Red Poll (2).										
Maryville Ella	5898A	28.10.37	19	7,265	4·17	303·13	230	Jr. 2	.. ..	Chandpara Ferdinand
Maryville Jean	6206D	20.10.37	12½	6,296	3·97	249·91	230	Jr. 2	.. ..	Chandpara Ferdinand
Calf, A. J., Werribee South, Jersey (2).										
Clydvale Carrilla	33266	29.9.37	14	8,037	5·50	442·22	350	Mature	426, 423, 468	Staghorn Master's Defiance
Kyora Gadget's Twinkle ..	58081	30.9.37	12	5,706	5·65	322·37	270	Jr. 3	323 ..	Gadget (Imp.)
Chadderton, J. E., Hamilton, Jersey (2).										
†Glen Leigh Dewdrop 2nd	39841	9.11.37	..	6,030	4·88	294·45	350	Mature	278, 286, 341	Strathkellar Topthorn
Glen Leigh Doris 3rd ..	37039	2.10.37	13	7,116	5·23	372·05	350	Mature	434, 493, 373, 378	Strathkellar Topthorn
Chirnside, R. M., Whittlesea, Jersey (12).										
Mornmoot Clementine ..	41121	24.10.37	15	9,596	5·73	550·01	350	Mature	331, 549, 563, 566	Werribee Prince Madeira
Mornmoot Clementine 2nd	54242	8.11.37	19½	8,241	5·43	447·52	250	Sr. 2	362 ..	Werribee Madeira's Ace
Mornmoot Clementine 5th	58561	3.12.37	20	6,428	5·50	353·74	230	Jr. 2	.. ..	Werribee Madeira's Ace
Mornmoot Fancy Madeira 4th	54245	2.11.37	19	8,144	6·00	488·51	250	Sr. 2	412 ..	Werribee Madeira's Ace
Mornmoot Lady Starbright	54247	2.12.37	30	8,453	4·84	409·17	230	Jr. 2	.. ..	War Valour (Imp.)
Mornmoot Princess Madeira	37071	31.10.37	24	9,510	5·47	519·99	350	Mature	424, 572, 773, 794, 794	Werribee Grandmaster
Mornmoot Princess Madeira 8th	54252	15.10.37	14	6,123	5·77	353·33	230	Jr. 2	.. ..	Werribee Madeira's Ace
Mornmoot Satisfaction 2nd	49661	21.11.37	17	7,877	5·93	467·00	290	Sr. 3	353 ..	Werribee Jupiter
Mornmoot Starbright ..	45271	19.11.37	18	8,921	5·13	457·86	310	Jr. 4	427, 501 ..	Mornmoot Mars
Mornmoot Stellar Princess 5th	54257	22.10.37	7½	4,293	5·83	250·46	230	Jr. 2	.. ..	Werribee Madeira's Ace
Werribee Prosperity ..	51184	18.10.37	20	8,562	5·63	482·13	270	Jr. 3	387 ..	War Valour (Imp.)
Werribee Stellar Princess ..	37073	7.12.37	30	11,271	5·74	646·63	350	Mature	440, 536, 574, 736	Werribee Butter King

* 248 days in test. † 240 days in test (sold).

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.		Sire.
Clarke, F. W., Toora, Jersey (1).											
MerVue Sister	58406	8.12.37	30½	11,168	5·63	629·16	270	Jr. 3	469	..	Woorayl Flashlight
Clark P. W., Whittlesea, Jersey (4).											
Coodardy Gentle Annette 6th	Vol. 25	7.11.37	14½	5,364	5·94	318·78	230	Jr. 2	..	..	Staghorn Lord Aldan 3rd
Wantirna Queen Mab ..	51090	15.11.37	10	6,413	5·38	345·01	350	Mature	..	..	Prince Hiawatha of Terangaville
Willis Vale Brigadier's Liberty	51218	12.10.37	13	6,258	5·80	363·11	350	Mature	..	..	Clarendon Eyre Eminent's Brigadier
Wompini Southern Fascination	46746	15.12.37	13	5,051	5·93	335·09	350	Mature	248, 403	..	Staghorn Butter's Masterpiece
Colenso, L. W. R., Alvie, Jersey (2).											
*Normandie Hawthorn 12th	Vol. 25	3.11.37	4	3,435	5·24	179·97	230	Jr. 2	..	..	Normandie Mayflower's Fancy Masterpiece
*Normandie Thelma 5th ..	58749	28.9.37	4	3,315	5·46	180·99	230	Jr. 2	..	..	Normandie Majestic
Coughlin, C., Catani, Jersey (7).											
Fairview Mavis 5th ..	39728	5.11.37	12	5,082	5·09	258·54	350	Mature	274	..	Fairview Cream Chief
Gladys Park Blue Bell ..	43934	28.10.37	6½	4,824	5·62	270·99	350	Mature	287, 252, 331		Werribee Bluebell's Masterpiece
Gladys Park Dinah ..	52791	25.12.37	7½	4,523	5·77	260·91	290	Sr. 3	251, 310	..	Banyule Silverstrain
Gladys Park Master's Petal 2nd	52793	23.11.37	13½	5,409	5·51	298·06	290	Sr. 3	282, 335	..	Werribee Bluebell's Masterpiece
Gladys Park Starbright 2nd	52794	15.11.37	12	3,870	6·49	251·22	310	Jr. 4	315	..	Banyule Silverstrain
Glen Valley Dawn ..	57470	28.10.37	7½	4,830	5·25	253·36	310	Jr. 4	397	..	Brucevale Wyandotte's King
Selsey Lady Viola ..	41946	10.10.37	10½	7,643	5·59	426·94	350	Mature	341, 389, 367, 392		Jubilee Asterlight
Coulthard, J., and Son, Whittlesea, Jersey (5).											
*Strathview Buttercup 2nd	42056	14.10.37	4	5,265	4·15	218·48	350	Mature	289, 184	..	Pat of Belgonia
Walamba Dot	C.R.	24.10.37	12	5,217	4·61	240·62	250	Sr. 2	..	..	Clarendon Eyre Brigadier 3rd
Walamba Kirsty's Pride ..	C.R.	26.12.37	13	4,512	5·43	245·17	230	Jr. 2	..	..	Mornmoot Manifest 2nd
Walamba Lady Bird ..	C.R.	2.11.37	10½	3,602	5·40	194·62	230	Jr. 2	..	..	Clarendon Eyre Brigadier 3rd
Wompini Lady Grey ..	Vol. 25	13.10.37	11	4,793	6·13	293·58	230	Jr. 2	..	..	Wompini Erl King
Crawford, Mrs. E., No. 1 Farm, Traralgon, Jersey (7).											
*Balniel Island Moira ..	Vol. 25	29.11.37	4	2,520	5·01	126·24	230	Jr. 2	..	..	Wompini Royal Master
Balniel Lotina	Vol. 25	28.11.37	15½	3,557	5·44	193·63	230	Jr. 2	..	..	Aveley Drummer
†Balniel Master's Marie ..	Vol. 25	1.12.37	4	1,845	4·79	88·38	230	Jr. 2	..	..	Werribee Royal Master
*Balniel Northwood Belle	Vol. 25	28.11.37	4	2,955	5·18	153·15	230	Jr. 2	..	..	Meldreth Norma's Improver
‡Balniel Posey	Vol. 25	27.11.37	4	2,385	5·35	127·65	230	Jr. 2	..	..	Aveley Drummer
Balniel Valour's Starbright	56235	28.10.37	9	4,167	5·39	224·50	270	Jr. 3	..	..	War Valour (Imp.)
Balniel Master's Bess ..	56232	2.11.37	4	3,590	5·83	209·27	230	Jr. 2	..	..	Werribee Royal Master
Crawford, Mrs. E., No. 2 Farm, Traralgon, Jersey (1).											
*Balniel Golden Belle ..	51633	3.10.37	4	5,205	4·56	237·30	290	Sr. 3	..	..	Warenda Snapdragon
Daley, Mrs. S. G., Terang, Jersey (3).											
Clarendon Eyre Emerald Isle 4th	56801	8.11.37	25	7,974	4·98	396·95	350	Mature	..	..	Victorious Pioneer (Imp.)
Glen Iris Golden Maid ..	39839	5.11.37	14	6,020	6·05	364·21	330	Sr. 4	..	..	Rochettes Golden (Imp.)
Springhurst Coronation Yarran	46186	8.11.37	14	6,585	5·65	371·86	350	Mature	294	..	Design's Ruler (Imp.)
De La Rue, N. C., Weering, Jersey (2).											
Lucerne Vale Master's Choice 2nd	49246	19.12.37	18½	5,576	6·20	345·99	290	Sr. 3	285	..	Werribee Fancy Masterpiece
Lucerne Vale Master's Queen	40777	6.12.37	5	6,317	5·38	339·92	350	Mature	279, 406, 382, 303		Werribee Fancy Masterpiece
Department of Agriculture, Werribee, Friesian (6).											
Victoria Amazon	Vol. 14	27.11.37	24½	8,220	3·77	309·80	250	Sr. 2	..	..	Victoria Joyous Mercedes
Victoria Ballerina ..	Vol. 14	13.11.37	20	10,274	3·62	371·90	270	Jr. 3	288	..	Victoria Joyous Mercedes
Victoria Domino Patch ..	3255	18.10.37	29	12,482	3·26	407·25	350	Mature	382, 372, 403, 441, 466, 424, 447		Victoria Patch
Victoria Joyous Song ..	Vol. 14	2.12.37	25	8,247	3·41	281·57	230	Jr. 2	..	..	Victoria Joyous Mercedes
Victoria Primadonna ..	Vol. 14	3.12.37	31	11,171	3·71	414·21	230	Jr. 2	..	..	Victoria Double Top
Victoria Songstress ..	3768	1.10.37	49½	18,905	2·78	526·22	350	Mature	347, 435, 468, 434, 506		Victoria Joyous Mercedes
Department of Agriculture, Werribee, Red Poll (12).											
Victoria Amaranth ..	3006A	15.12.37	17	8,100	4·02	325·57	350	Mature	248, 287, 342, 345, 354		Vice Regal
Victoria Eructation ..	3226C	14.10.37	18½	8,183	4·06	332·37	350	Mature	338, 369, 340, 365, 395, 371		Victoria Volcano
Victoria Friesia	5060B	11.12.37	7½	6,080	4·24	257·58	330	Sr. 4	264, 348	..	Victoria Royal Ringer

* 240 days in test. † 150 days in test. ‡ 210 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Department of Agriculture, Werribee—*continued.*										
Victoria Maid Marion ..	5690AA	19.10.37	28½	9,536	4·58	436·90	270	Jr. 3	316 ..	Woodburn Peter Pan
Victoria Nectarine ..	3917A	8.12.37	20½	8,700	3·99	347·47	350	Mature	254, 280, 325	Victoria Royal Ringer
Victoria Nicotina ..	3027A	24.12.37	16½	7,122	4·02	286·47	350	Mature	323, 320, 313, 352, 336	Earl of Beaconsfield
Victoria Pepita	6027A	8.10.37	23½	8,397	4·41	369·93	270	Jr. 3	.. ..	Woodburn Peter Pan
Victoria Royal Red Cross ..	4506AA	13.11.37	9½	8,340	3·87	322·89	330	Sr. 4	214, 304 ..	Victoria Royal Ringer
Victoria Royal Velvet ..	3518AA	25.12.37	4½	7,091	4·41	312·90	350	Mature	247, 301 ..	Victoria Royal Ringer
Victoria Separation ..	3926A	12.11.37	26	10,121	3·82	386·26	350	Mature	215, 279, 333	Dominion Bright Belgian
Victoria Volt	4049B	10.10.37	23½	12,853	4·18	537·10	350	Mature	296, 369, 398, 515	Victoria Vice Captain
Victoria Wendy	6034A	27.9.37	19	8,274	4·46	368·86	230	Jr. 2	.. ..	Woodburn Peter Pan
Dookie Agricultural College, Dookie, Ayrshire (4).										
Dookie Lilac	27119	2.10.37	20	9,726	3·58	348·40	350	Mature	450, 348, 389	Dookie Emblem
Dookie Sappho	23672	27.9.37	28	15,011	4·97	746·43	350	Mature	451, 423, 545, 565, 584	Dookie Beau
Dookie Shirley	24815	27.9.37	20½	11,052	3·99	441·39	350	Mature	466, 308, 495, 501	Longerenong Laurie
Dookie Sparkle	27121	7.10.37	24	12,163	4·10	498·98	330	Sr. 4	405, 544 ..	Dookie Emblem
Dwyer, G., Balwyn Jersey (3).										
Glen Iris Golden Napoleonette	52817	28.9.37	8	3,431	6·04	207·29	230	Jr. 2	.. ..	Designs Golden Oxford (Imp.)
Karalee Linda 2nd ..	44643	5.11.37	16	4,218	6·19	261·29	350	Mature	256, 418, 339, 313	Karalee Volunteer 4th
Karalee Linda 3rd ..	48943	9.10.37	5	4,593	5·94	272·77	350	Mature	350, 332, 322 ..	Karalee Volunteer 6th
Enders, N. H., Stanhope, Jersey (1).										
Rintoul View Rosemary ..	38214	28.11.37	17	7,833	5·52	432·33	350	Mature	441, 450, 579, 477, 467	Banyule Triplane
Fairchild and Clutterbuck, Tinamba, Jersey (1).										
Vaucluse Daphne ..	51012	29.10.37	12½	6,494	6·67	432·92	350	Mature	274, 323, 519	Vaucluse Duke 3rd
Fixter, A., Boisdale, Guernsey (3).										
Avonview Daphne ..	3309	4.10.37	15½	7,058	4·92	347·44	350	Mature	317, 327 ..	Melbourne Sandboy 6th
Avonview Golden Fairy ..	3967	3.10.37	19	7,896	5·76	454·79	290	Sr. 3	.. ..	Avonview Golden Lord
Runica's Jessie	2163	10.10.37	18	9,764	6·12	597·56	350	Mature	382, 471, 509, 473	Werribee Jessie's Boy
Fixter, W., Boisdale, Jersey (2).										
Olivedale Dianthus ..	34006	31.10.37	27	8,849	5·51	487·87	350	Mature	261, 425, 419, 406, 488	Studleigh Masterpiece
Olivedale Pearl 2nd ..	49943	15.11.37	20½	7,598	5·59	424·99	330	Sr. 4	369, 434, 449	Omatoroa Kingsford Smith
Foster Bros., Boisdale, Jersey (14).										
*Boisdale Blonde ..	38941	17.12.37	4	4,089	5·85	239·08	350	Mature	234 ..	Gladiator of Springhurst
Boisdale Brunette 3rd ..	38942	28.10.37	4	3,830	4·91	188·11	350	Mature	254, 307, 379, 391	Gladiator of Springhurst
Boisdale Countess 3rd ..	51841	8.12.37	17	5,060	5·85	296·02	270	Jr. 3	224 ..	Boisdale Dazzler
Boisdale Dolly	47289	5.11.37	5	4,636	5·47	253·57	330	Sr. 4	247, 302 ..	Gladiator of Springhurst
Boisdale Fairy	43050	1.10.37	7½	5,463	5·68	310·32	350	Mature	204, 246, 329	Gladiator of Springhurst
Boisdale Fairy 2nd ..	51843	3.11.37	6	5,079	5·41	274·54	290	Sr. 3	312 ..	Gladiator of Springhurst
Boisdale Madeira ..	28701	6.12.37	6½	2,826	4·05	114·49	350	Mature	245, 285, 303, 162	Handsome Boy 4th of Jerseyholm
Boisdale Marge	38946	30.10.37	4½	4,353	4·89	212·87	350	Mature	242, 328 ..	Gladiator of Springhurst
Boisdale Nette	37385	2.12.37	11	4,443	5·19	230·64	350	Mature	300, 365, 334, 301	Boisdale Fox
Boisdale Netta 2nd ..	38947	9.10.37	5	4,791	5·44	260·51	350	Mature	230, 320, 261, 260	Gladiator of Springhurst
Boisdale Nightshade 2nd ..	47296	9.10.37	15	5,543	5·15	285·58	330	Sr. 4	284, 352 ..	Gladiator of Springhurst
Boisdale Sparkle ..	28702	21.12.37	12	4,701	5·56	261·59	350	Mature	304, 367, 487, 406, 239	Lord Island's Fancy of Brucevale
Boisdale Twilight ..	47297	14.12.37	9½	3,997	5·20	207·78	310	Jr. 4	236, 226 ..	Boisdale Dazzler
Hazeldale Ginger Princess ..	40175	22.11.37	9½	5,087	4·71	239·54	350	Mature	276, 255, 295	Dinkim of Banyule
Fraser, G. A., Addington, Ayrshire (3).										
Bonnie Doon Heatherbell ..	28138	10.12.37	20½	10,503	5·29	555·51	270	Jr. 3	351 ..	Glengowrie Masterpiece
Bonnie Doon Lena ..	29147	12.12.37	20	7,221	4·49	324·15	230	Jr. 2	.. ..	Bonnie Doon Baronet
Tooleen Winnie ..	14893	4.10.37	12½	7,052	3·65	257·33	350	Mature	262, 402, 305	Peer 2nd of Glengowrie
Gay, R. G., and Son, North Devon, Jersey (3).										
Elm Grove Silverbell 4th ..	Vol. 25	2.12.37	10½	4,430	5·24	232·14	230	Jr. 2	.. ..	Elm Grove Fowler's Prince
Elm Grove Veronique ..	57177	14.11.37	9½	5,613	5·75	322·96	270	Jr. 3	223 ..	Elm Grove Starlight
Myrtle Point Songstress ..	45341	4.10.37	30½	12,126	4·98	603·68	350	Mature	458, 498, 540	Werribee Master King
Goddard, J. H., Cora Lynn, Ayrshire (3).										
†Donside Thistledown 2nd	23662	23.11.37	4	9,630	4·08	393·06	350	Mature	401, 529, 488	Olive Dale Chum
‡Inverurie Loco Lady ..	30703	30.9.37	4	4,680	3·44	160·83	230	Jr. 2	.. ..	Inverurie Laddie
Inverurie Meg	30705	26.9.37	11½	7,206	3·76	270·62	230	Jr. 2	.. ..	Inverurie Laddie

* 261 days in test. † 210 days in test. ‡ 240 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Handbury, J. E., and Son, No. 1 Farm, Toora, Jersey (2).										
Tooravale Lassie 22nd ..	Vol. 25	29.9.37	12	6,180	5·69	351·45	230	Jr. 2	.. ..	Pinewoods Aristocrat (Imp.)
Tooravale Lassie Fowler 21st	Vol. 25	5.11.37	15	5,966	5·35	319·29	230	Jr. 2	.. ..	Tooravale Monica's Son
Handley, S. C., Dandenong, Jersey (1).										
Barrowby Briar Rose ..	Vol. 25	8.10.37	21½	6,335	4·79	303·14	230	Jr. 2	.. ..	Barrowby Sonny
Harvey, T., Boisdale, Jersey (6).										
Jerseyholm Blue Bell 9th ..	25394	19.10.37	16½	7,730	4·85	374·84	350	Mature	361, 539, 494, 451, 466, 414	Lord Island Fancy of Brucevale
Jerseyholm Blue Bell 15th	40373	7.11.37	20½	7,757	5·41	419·63	350	Mature	354, 389, 451	Werribee Master's Expert
Jerseyholm Blue Bell 18th	44479	17.10.37	9½	6,839	5·36	366·88	330	Sr. 4	371, 433 ..	Werribee Master's Fox
Jerseyholm Blue Bell 19th	44480	14.11.37	10	5,637	5·41	304·85	310	Jr. 4	312 ..	Werribee Master's Fox
Jerseyholm Empress 22nd	37506	13.12.37	17	6,437	5·10	327·97	350	Mature	344, 419, 393, 380	Lord Island Fancy of Brucevale
Jerseyholm Empress 34th ..	40381	25.10.37	14½	6,078	5·38	326·76	350	Mature	278, 291, 336	Werribee Master's Fox
Haywood, Dr. A. R., Hastings, Jersey (2).										
Kyora Twinkles Dream ..	49065	2.10.37	7	6,095	5·59	340·95	350	Mature	177, 289 ..	Kyora Adore's Volunteer
Windrest Twinkle Adore ..	Vol. 25	28.9.37	7	4,959	6·63	328·68	250	Sr. 2	.. ..	Kyora Hero
Henderson, W., Grasmere, Ayrshire (6).										
Carracoorte Blanche 10th ..	24676	14.12.37	23	7,407	4·83	357·73	350	Mature	255, 250, 331, 334	Blue Bell's Pride of Glencourt
Carracoorte Bonnie 7th ..	30256	3.10.37	9	4,641	4·11	190·85	270	Jr. 3	.. ..	Grand View Bernie
Carracoorte Buttercup 4th	29205	2.10.37	8½	4,599	4·39	201·99	270	Jr. 3	133 ..	Grand View Begonia's Hot Stuff
Carracoorte Gladys ..	30261	13.11.37	4	4,128	4·53	186·86	270	Jr. 3	.. ..	Grand View Bernie
Carracoorte Violet 9th ..	30270	27.10.37	10½	4,664	4·41	205·58	230	Jr. 2	.. ..	Carracoorte Panic
Jennewar Poppy	28611	19.12.37	9½	3,851	4·94	190·05	310	Jr. 4	228 ..	Carracoorte Opperman
Herzog, R. F., Nilma, Illawarra Shorthorn (1).										
*Grantville Flower ..	16669	3.10.37	..	6,615	3·96	261·66	250	Sr. 2	.. ..	Greyleigh Resolute
Hore, E., Leitchville, Jersey (4).										
Leven Brae Gay Countess ..	40698	17.10.37	23	9,129	4·71	429·90	350	Mature	247, 342, 441, 531, 403, 438, 410	Werribee Gay Piece
Melvue Lady Dilys ..	58463	12.12.37	7	5,894	4·93	290·52	270	Jr. 3	314 ..	Glen Iris Lord Viola 2nd
Tavistock Mountain Maid	55441	13.10.37	24	8,886	5·95	528·72	310	Jr. 4	399 ..	Werribee Ranger
Troed-Yr-Rhiw Carlad 2nd	50927	25.11.37	19	8,448	5·50	464·79	350	Mature	360, 454, 523	Glen Iris Montrose Duke
Huffer, J. A., Gormandale, Jersey (1).										
Glen Valley Mercedes 2nd ..	57472	28.9.37	7	5,213	5·46	284·66	310	Jr. 4	363 ..	Brucevale Wyandotte King
Hurrey, W. H., Koonwarra, Jersey (11).										
Burwood Cream Belle 3rd ..	Vol. 25	23.10.37	10	4,976	5·64	280·49	230	Jr. 2	.. ..	Kooreena Handsome Lad
Kooreena Audrey 6th ..	49030	6.10.37	10½	6,225	6·00	373·25	310	Jr. 4	331, 405 ..	Kooreena Carrie 3rd's Halo
Kooreena Audrey 7th ..	49031	9.11.37	9½	5,681	6·70	380·71	310	Jr. 4	343, 435 ..	Kooreena Carrie 3rd's Delegate
Kooreena Audrey 8th ..	49032	22.10.37	11½	5,465	7·39	403·76	290	Sr. 3	284, 384 ..	Kooreena Carrie 3rd's Delegate
Kooreena Carrie 7th ..	58055	7.11.37	9	3,606	6·63	239·13	270	Jr. 3	279 ..	Kooreena Carrie 3rd's Halo
Kooreena Glamour ..	Vol. 25	29.9.37	9½	4,244	6·05	256·76	230	Jr. 2	.. ..	Kooreena Carrie 3rd's Halo
Kooreena Lady 6th ..	49035	15.11.37	14	6,578	5·84	384·39	310	Jr. 4	294, 389 ..	Kooreena Carrie 3rd's Halo
Kooreena Lotina	58057	3.10.37	10½	5,550	6·44	357·65	270	Jr. 3	.. ..	Kooreena Carrie 3rd's Halo
Kooreena Minerva 2nd ..	25952	15.11.37	20	7,716	5·72	441·22	350	Mature	289, 482, 491, 529	Columbine Defiance of Linga Longa
Kooreena Mourier Princess	Vol. 25	2.10.37	9	4,482	6·33	283·74	230	Jr. 2	.. ..	Kooreena Carrie 3rd's Halo
Kooreena Yo Yo 2nd ..	58059	20.10.37	11	5,315	6·79	360·82	270	Jr. 3	346 ..	Kooreena Mourier King 2nd
King, H. W., Warragul, Jersey (1).										
*Glen Valley Sand Daisy 5th	Vol. 25	30.9.37	..	4,675	5·34	249·58	230	Jr. 2	.. ..	Glen Valley Handsome Boy 2nd
Leask, G. C., Garfield, Ayrshire (3).										
Dandy Bonnie Lass ..	29296	16.10.37	4	6,738	4·17	280·68	250	Sr. 2	285 ..	Maesgwyn Prince Alfred (Imp.)
†Glen View Nessie 9th ..	30600	24.10.37	4	6,210	4·08	253·44	310	Jr. 4	.. ..	Glen View Standish
†Gleneira Cherry Lass ..	C.R.	31.10.37	4	3,975	4·16	165·21	230	Jr. 2	.. ..	Gleneira Frederick
Le Noury, E., Werribee South, Guernsey (1).										
Werribee Rambler's Delight	3931	30.9.37	4	5,594	4·62	258·32	350	Mature	316, 351, 338	Valentine Salone of Maple Lodge

* 240 days in test (herd withdrawn). † 240 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Lyon, C. G., Heidelberg, Jersey (11).										
Banyarra Attraction's Madeira 2nd	47115	14.11.37	18	6,246	6·03	376·80	310	Jr. 4	296, 418 ..	Retford King Bracken
Banyarra Attraction's Madeira 4th	56249	15.10.37	19	6,101	5·30	323·34	230	Jr. 2	.. ..	Banyarra Velvetation
*Banyarra Silvermine 2nd	51647	4.11.37	..	4,260	4·78	203·49	270	Jr. 3	260 ..	Banyarra Velvetation
Banyule Dea	42881	5.12.37	20	5,342	6·21	331·65	310	Jr. 4	325, 352 ..	Oxford Beau's Pretty Oxford (Imp.)
Banyule Ettie 19th ..	51649	15.10.37	13	4,449	4·78	212·78	230	Jr. 2	.. ..	Oxford Beau's Pretty Oxford (Imp.)
*Banyule Lotus Leaf ..	47119	16.12.37	..	3,930	5·11	200·76	270	Jr. 3	281 ..	Oxford Beau's Pretty Oxford (Imp.)
Banyule Molly 53rd ..	51651	7.10.37	16½	5,646	5·35	301·97	230	Jr. 2	.. ..	Banyule Pitman
Banyule Silvermine 42nd ..	21435	19.12.37	18½	6,776	5·52	373·90	350	Mature	344, 406, 510, 490, 371, 502	Wotton Airman (Imp.)
Banyule Silvermine 97th ..	51656	8.11.37	18½	6,372	6·02	383·40	230	Jr. 2	.. ..	Banyule Silver Plane
Banyule Tiddlewinks 12th	38807	31.10.37	21	8,349	4·97	414·84	350	Mature	367, 443 ..	Banyule Lord Silvair
Banyule Tiddlewinks 22nd	51662	26.10.37	13½	5,051	5·35	270·44	230	Jr. 2	.. ..	Banyule Supreme
Macauley, C. W., Rochester, Jersey (4).										
Taranah Chime	55424	1.11.37	8½	5,738	5·50	315·47	350	Mature	303, 402, 483, 415	Duke of Invermay
Taranah Flora 2nd ..	59633	21.10.37	4	6,936	5·39	373·94	250	Sr. 2	340 ..	Taranah Commander
Taranah Floss	37857	1.11.37	11½	6,651	5·53	367·63	350	Mature	313, 399, 455, 530, 479, 499	Duke of Invermay
Taranah Rainbow ..	42118	9.10.37	10	6,711	5·38	361·15	350	Mature	343, 433, 425, 487, 428	Duke of Invermay
McCosh, S. J., Wandin North, Jersey (2).										
Heathermont Countess ..	48639	18.11.37	11½	4,838	5·63	272·16	290	Sr. 3	212, 202 ..	Woodside Mabel's Volunteer
Monmoot Modesty 5th ..	41128	26.9.37	11½	6,486	5·47	354·58	350	Mature	362, 380, 378	Werribee Prince Madeira
McErvale, I., and Sons, Camperdown, Jersey (3).										
Cumnock Delysia ..	Vol. 25	28.9.37	12	5,366	5·29	283·98	270	Jr. 3	.. ..	Cumnock Fancy's Masterpiece
Cumnock Gay Lady ..	57027	27.9.37	14½	6,569	4·84	318·22	310	Jr. 4	.. ..	Cumnock Recovery
Cumnock Marigold ..	Vol. 25	14.10.37	11½	5,616	5·04	282·82	310	Jr. 4	.. ..	Cumnock Fancy's Masterpiece
McNabb, G. A., and Son, Irrewillipe East, Jersey (2).										
Maxon Count's Daisy 2nd	54017	29.9.37	15	5,288	5·54	292·70	270	Jr. 3	245 ..	Maxon Count Graceful
Maxon Noble's Goldfinch ..	45069	6.11.37	17	7,496	5·63	421·90	350	Mature	331, 372, 478	Avalon Noble 8th
Maher, R. H., Tongala, Jersey (15).										
Rosemont Jenny Lind 9th	50456	5.12.37	16½	5,309	5·61	297·76	350	Mature	343, 309, 356	Rosemont Laddie Fowler 3rd
Rosemont Jenny Lind 10th	55080	28.9.37	9	5,630	5·61	315·91	290	Sr. 3	224, 346 ..	Rosemont Laddie Fowler 3rd
Rosemont Jenny Lind 12th	Vol. 25	2.11.37	16½	4,398	6·01	264·44	230	Jr. 2	.. ..	Rosemont Golden Emblem
Rosemont Lady Fowler 5th ..	37876	25.12.37	15½	5,237	5·58	292·24	350	Mature	319, 317, 299, 345, 338, 293	Rosella 2nd's Noble of Rosemont
Rosemont Lady Fowler 6th	41864	8.10.37	9½	5,831	5·55	323·90	350	Mature	305, 259, 344, 291, 282	Rosella 2nd's Noble of Rosemont
Rosemont Lady Fowler 14th	Vol. 25	6.11.37	14½	5,405	4·91	265·51	230	Jr. 2	.. ..	Rosemont Golden Emblem
Rosemont Lady Fowler 15th	Vol. 25	28.11.37	17	4,606	4·86	223·67	230	Jr. 2	.. ..	Rosemont Golden Emblem
Rosemont Lady Fowler 17th	Vol. 25	7.11.37	11	4,203	5·49	230·84	230	Jr. 2	.. ..	Rosemont Defence
Rosemont Lassie Fowler 13th	Vol. 25	10.11.37	9	3,626	5·57	202·07	230	Jr. 2	.. ..	Rosemont Laddie Fowler 3rd
Rosemont Laura 9th ..	Vol. 25	7.11.37	11	3,704	5·13	189·90	230	Jr. 2	.. ..	Rosemont Laddie Fowler 3rd
Rosemont Primrose 3rd ..	37879	5.11.37	20½	7,722	5·21	402·05	350	Mature	339, 191, 160, 357, 341, 364	Lassie's Duke of Eurangee
Rosemont Silvermine ..	37880	3.11.37	14	5,844	5·40	315·72	350	Mature	258, 260, 270, 334, 320, 336	Rosella 2nd's Noble of Rosemont
Rosemont Silvermine 3rd ..	50462	10.10.37	9½	5,171	5·56	287·27	350	Mature	208, 243, 254	Rosemont Laddie Fowler 3rd
Rosemont Silvermine 8th ..	Vol. 25	30.10.37	11	3,602	5·65	203·66	230	Jr. 2	.. ..	Rosemont Golden Emblem
Rosemont Silvermine 9th ..	Vol. 25	30.10.37	16½	4,835	6·06	292·87	230	Jr. 2	.. ..	Rosemont Laddie Fowler 3rd
Maloney, P. J., Tongala, Jersey (5).										
Belgonia Design's Peggy 12th	51701	29.10.37	9	7,232	5·01	362·14	270	Jr. 3	.. ..	Design's Ruler (Imp.)
Belgonia Gem's Noella 2nd	56320	27.10.37	12	6,398	5·63	359·90	270	Jr. 3	.. ..	Design's Ruler (Imp.)
Belgonia Junette ..	38829	3.10.37	15½	8,396	5·71	479·70	350	Mature	347, 434, 505	Retford Glider
Belgonia Peggy 10th ..	38831	12.12.37	16	7,932	5·30	420·73	350	Mature	475, 473, 481	Aveley Rex
Fairview Petal 2nd ..	43866	19.12.37	17	6,737	5·73	386·25	350	Mature	.. ..	Fairview Cream Chief
Masters, S. H., Murraydale, Jersey (2).										
Rutland Brunette 13th ..	59357	12.10.37	19	7,268	5·43	394·87	270	Jr. 3	305 ..	Kings Vale Lauder
Rutland Brunette 16th ..	Vol. 25	10.10.37	20	6,686	5·43	362·77	230	Jr. 2	.. ..	Kings Vale Lauder
Meaklim Bros., Mooroopna, Dairy Shorthorn (4).										
Drumnell Duchess 3rd ..	D.S.H.B. 26.10.37		N.O.C.	11,247	3·63	409·28	350	Mature	374, 425, 441	Bounty of Darbalara
Drumnell Pearl 2nd ..	D.S.H.B. 7.10.37		14	6,305	4·21	265·44	230	Jr. 2	.. ..	Drumnell Bounty
Drumnell Queenie ..	D.S.H.B. 23.10.37		N.O.C.	10,022	4·10	410·99	350	Mature	425, 424, 461	Willow Park Rosemont
Drumnell Roany 2nd ..	D.S.H.B. 11.10.37		16½	9,680	4·49	434·20	350	Mature	370, 397 ..	Willow Park Reformer

* 210 days in test (sold).

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Mesley, W. T., Dalyston, Jersey (2).										
•Warenda Gazelle 14th ..	C.R.	24.11.37	4	3,360	5·25	176·44	230	Jr. 2	.. ..	Warenda Perpetuate
•Warenda Mandolin 14th ..	C.R.	4.10.37	4	5,246	4·99	261·57	230	Jr. 2	.. ..	Warenda Perpetuate
Mitchell, R. H., Linton, Jersey (2).										
Clifford Farm Mercia ..	56820	20.12.37	26	6,859	6·16	422·31	270	Jr. 3	.. ..	Wompini V.C.
Clifford Farm Norma ..	Vol. 25	23.10.37	18½	5,981	6·26	374·70	230	Jr. 2	.. ..	Wompini V.C.
Moore, J., and Co., Yarram, Jersey (4).										
Glen Iris Designs Lady ..	43967	8.10.37	8½	5,520	5·21	287·61	290	Sr. 3	.. ..	Design's Ruler (Imp.)
Tooloonook Maiden 4th ..	50885	27.9.37	7	6,651	4·56	303·57	330	Sr. 4	231, 283, 162	Heroic of Somerville
Tooloonook Molly 10th ..	Vol. 25	31.10.37	6	5,832	4·93	287·74	270	Jr. 3	.. ..	Heroic of Somerville
Tooloonook Peach ..	33545	1.10.37	13	9,939	4·47	443·80	350	Mature	282, 358, 338, 384, 411, 432	Tooloonook Carob's Hero
Murdoch, J. T., and Son, Lismore, Jersey (2).										
Ismalia Petal 2nd ..	Vol. 25	11.11.37	15½	5,753	5·07	291·74	230	Jr. 2	.. ..	Murona Twylair
Murona Garenne ..	54325	9.11.37	10	6,336	6·02	381·72	310	Jr. 4	312 ..	Banyule Airpoise
Nancarrow Bros., Kerang, Jersey (4).										
Pine Ridge Countess ..	50167	31.10.37	12½	6,233	5·41	337·03	330	Sr. 4	281, 309, 356	Bellaire Count
Pine Ridge Molly ..	Vol. 25	1.10.37	14	5,279	5·39	284·80	230	Jr. 2	.. ..	Duke of the Lake (Imp.)
Pine Ridge Princess 2nd ..	58998	13.10.37	9½	5,350	5·53	295·90	250	Sr. 2	238 ..	Duke of the Lake (Imp.)
Pine Ridge Wattle ..	54756	21.10.37	8½	5,703	4·38	249·86	290	Sr. 3	232, 294 ..	Pat of Belgonia
Nicholas, A. M., Sherbrooke, Jersey (8).										
Brampton Standard Dream 2nd	56047	21.10.37	17	6,016	6·38	383·74	270	Jr. 3	358	Brampton Sporting Standard
Jubilee Myrtle	33665	4.11.37	16	6,534	4·84	316·09	350	Mature	342, 354, 400, 316, 421, 372	Jubilee Whatlight
Jubilee Rowan	38128	27.9.37	15½	7,091	4·90	347·23	350	Mature	308, 405, 372, 386, 322	Jubilee Whatlight
Jubilee Weigelia	40438	12.10.37	12	7,901	4·94	390·07	350	Mature	223, 368, 374, 400	Jubilee Asterlight
Selsey Design's Wyandotte	46130	9.10.37	N.o.o.	5,743	5·76	330·80	350	Mature	314, 385, 302	Designs Ruler (Imp.)
Selsey Roseleaf 2nd ..	55211	24.10.37	18	6,954	6·04	420·09	270	Jr. 3	367 ..	Brampton Great Boy (Imp.)
Selsey Starbright ..	50573	8.11.37	16	5,081	6·34	322·36	310	Jr. 4	375, 316 ..	Brampton Great Boy (Imp.)
Brampton Champion's Miss (Imp.)	56042	11.12.37	12	3,797	6·18	234·69	230	Jr. 2	.. ..	Brampton Son of Champion's
Noble, T. M., and Sons, Maffra, Jersey (9).										
Finchley Handsome Girl ..	39740	27.10.37	12	6,564	6·31	414·35	350	Mature	413, 450, 488	Werribee Lord Burnham
Finchley Lady Burnham ..	48199	13.11.37	12	5,348	7·18	383·82	310	Jr. 4	328 ..	Werribee Lord Burnham
Finchley Lillian 2nd ..	Vol. 25	12.11.37	14	6,300	5·31	334·79	270	Jr. 3	.. ..	Werribee Lord Burnham
Finchley Masters Canary 2nd	Vol. 25	13.11.37	14	5,730	5·98	342·65	230	Jr. 2	.. ..	Finchley Masterman
Finchley Music 4th ..	52728	18.11.37	13	5,486	6·70	367·52	310	Jr. 4	385 ..	Finchley Masterman
Finchley Music 5th ..	Vol. 25	18.11.37	21½	7,598	5·84	443·87	230	Jr. 2	.. ..	Finchley Vasilika's Masterpiece
Finchley Nasturtium 2nd ..	Vol. 25	23·10·37	25	8,828	5·26	464·38	330	Sr. 4	361, 403 ..	Werribee Lord Burnham
Finchley Nasturtium 3rd ..	57280	26.10.37	10	6,119	6·31	386·24	330	Sr. 4	426 ..	Finchley Lord Burnham 2nd
Linga Longa Wattle's Speck	25574	12.10.37	25	8,519	5·29	450·24	350	Mature	317, 373, 410, 492, 558, 468, 480, 499, 521	Canary's Handsome Boy of Linga Longa
Norman, J. G., Pennyroyal, Jersey (1).										
Bannaview Lilac Domino 5th	C.R.	22.10.37	19½	6,719	5·35	359·68	230	Jr. 2	.. ..	Bannaview Silvermine's Sultan
O'Neill, J., Echuca Village, Jersey (3).										
Strathbow Heather Belle ..	29326	20.10.37	13½	6,846	6·01	411·32	350	Mature	362, 508, 546, 469, 399, 499	Studleigh Noble
Ullina Heather	Vol. 25	26.11.37	18	5,378	5·24	281·58	230	Jr. 2	.. ..	Ballara Fancy King
Ullina Violet	59831	8.11.37	16	6,630	4·88	323·51	270	Jr. 3	292 ..	Ballara Fancy King
Pattison, F., Tongala, Ayrshire (8).										
Boringa Queenie	26978	6.10.37	6	8,615	4·00	344·52	350	Mature	322, 318, 346	Oakbank Wireless
Willow Park Eva ..	31006	18.10.37	16	8,958	4·25	380·63	310	Jr. 4	316 ..	Fulham Beam
Willow Park Jean ..	25567	3.10.37	14	8,649	3·62	313·36	350	Mature	269, 300, 322	Willow Park Prince
Willow Park Jeanette ..	31007	8.10.37	10½	7,907	4·34	342·77	270	Jr. 3	.. ..	Fulham Beam
•Willow Park Pearl ..	22243	4.10.37	4	7,200	4·15	299·01	350	Mature	260, 318, 305, 330, 352, 350	Clansman of Glenholme
Willow Park Queenie ..	31010	10.10.37	13	6,729	4·40	296·39	230	Jr. 2	.. ..	Willow Park Prince
Willow Park Rosie ..	23344	2.10.37	8	10,248	3·56	364·87	350	Mature	248, 308, 349, 374, 341	Willow Park Prince
Willow Park Rosina ..	26810	16.10.37	18	8,793	4·04	355·07	330	Sr. 4	278, 376 ..	Fulham Beam

* 240 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Payne, A. E. T., Lilydale, Guernsey (5).										
Pearl 2nd of Kings Mills (Imp.)	26549 P.S.	15.10.37	9	5,847	5·05	295·03	290	Sr. 3	364 ..	Emblem of Kings Mills
Yarraview Alys	6623	19.10.37	25½	7,742	4·89	378·54	230	Jr. 2	.. ..	Yarraview Contralto
Yarraview Fay	6635	9.10.37	13½	6,435	5·25	337·53	230	Jr. 2	.. ..	Yarraview Gem 2nd
Yarraview Julie	3560	9.12.37	30½	11,372	5·10	579·78	350	Mature	480, 353 ..	Camellia's Majestic of Maple Lodge (Imp.)
Yarraview Meta	5176	10.10.37	18½	8,747	4·65	406·79	310	Jr. 4	310, 383 ..	Camellia's Majestic of Maple Lodge (Imp.)
Phillips, J. H., Swan Hill, Jersey (3).										
Kantara Jessamine 2nd ..	40487	22.10.37	9½	8,804	5·13	451·33	350	Mature	331, 363, 404 422, 413	Glen Iris Valiant Count
Ryelands Sweet Lavender ..	59362	26.11.37	11½	5,028	4·89	245·62	250	Sr. 2	232 ..	Orphanage Zaffarine's Prince
Peri Vanilla 7th	54746	2.12.37	15½	6,932	4·95	343·31	350	Mature	339, 360 ..	Leahurst Royal Rover
Powell, T. S., Mansfield, Jersey (5).										
Mornmoot Clementine 3rd	54243	25.11.37	26	7,817	5·68	443·62	250	Sr. 2	407 ..	Werribee Madeira's Ace
Mornmoot Northwood Madeira 3rd	41129	23.10.37	13	7,151	5·11	365·46	350	Mature	450 ..	Werribee Prince Madeira
Mornmoot Pincess Madeira 2nd	45268	21.10.37	14	8,699	5·87	510·32	330	Sr. 4	480, 584, 570	Mornmoot Starbright King
Mornmoot Princess Madeira 6th	54250	14.10.37	17	8,007	6·05	484·76	250	Sr. 2	406 ..	Werribee Prince Madeira
Wompini Starbright ..	60091	30.10.37	18	6,324	6·24	394·54	290	Sr. 3	371 ..	Werribee Butter King
Read, J. D., Springhurst, Jersey (3).										
Anenome's Love (Imp.) ..	42695	9.11.37	14	6,582	5·35	351·88	350	Mature	.. ..	Anenome's Lily Oxford
*Glen Iris Anenome's Rosebay	48260	16.10.37	4	4,305	4·61	198·54	250	Sr. 2	.. ..	Glen Iris Royal Rosebay
Springhurst Tomato 3rd ..	38110	2.12.37	13	6,354	5·90	374·61	350	Mature	450, 537, 565, 540, 542	Starbright's Prince of Glen Iris
Richardson, W. S., Bacchus Marsh, Jersey (1).										
Sutton Lea Pariel 3rd ..	50726	29.11.37	12	5,103	5·77	294·44	350	Mature	315, 384 ..	Sutton Lea Garnap
Ronalds, O., Jindivick, Jersey (1).										
Jindivick Buttercup ..	48872	2.11.37	13	8,280	5·81	481·25	310	Jr. 4	.. ..	Somerville Master Babs
Salesian College, Sunbury, Friesian (3).										
Rupertswood Cordyline Josie	Vol. 14	13.12.37	26	9,310	3·71	345·77	230	Jr. 2	.. ..	Rupertswood Dorothems
Rupertswood Woodcrest Milky	C.R.	25.11.37	16½	7,249	4·31	312·42	270	Jr. 3	.. ..	Cordyline Cremona Pontiac
Tulla Pontiac Lady ..	Vol. 14	25.11.37	25	10,068	3·74	376·07	350	Mature	372, 421 ..	Clarendon Eyre Inka Pontiac
Sebire, T., Wandin Yallock, Jersey (1).										
†Wandin Madeira's Queen	55758	2.12.37	..	6,600	4·84	319·49	310	Jr. 4	244, 289 ..	Leven Brae Kingdom
Shearman, A. and W., Darnum, Jersey (3).										
Darnum Park Minnie Ha-ha 2nd	C.R.	29.10.37	10	4,680	4·56	213·36	230	Jr. 2	.. ..	Darnum Park Starbright's Masterpiece
Darnum Park Molly Ha-ha 2nd	Vol. 25	29.10.37	5	4,536	5·29	240·05	230	Jr. 2	.. ..	Darnum Park Starbright's Masterpiece
Darnum Park Royal Duchess	Vol. 25	1.10.37	5	3,810	6·09	232·18	270	Jr. 3	264 ..	Darnum Park Starbright's Masterpiece
Smith Bros., Mirboo North, Jersey (10).										
Sylvan Hill Beauty ..	38277	20.10.37	7½	5,448	5·93	322·97	350	Mature	435, 375, 405, 359, 421	Somerville Heir Apparent
Sylvan Hill Countess ..	38278	10.11.37	17	7,296	5·19	378·66	350	Mature	443, 379, 384, 367, 374	Somerville Heir Apparent
Sylvan Hill Lady Grey ..	59604	29.10.37	10	4,892	6·08	297·49	270	Jr. 3	257 ..	Jerseyholm Handsome Boy 3rd
‡Sylvan Hill Lorna ..	42092	13.11.37	4	2,895	6·45	186·63	350	Mature	312, 307, 334, 321, 323	Somerville Heir Apparent
Sylvan Hill Lotus ..	55380	2.12.37	11½	4,143	5·77	239·19	310	Jr. 4	228, 288 ..	Jerseyholm Handsome Boy 3rd
Sylvan Hill Meadow Queen	55381	31.10.37	6½	5,768	6·10	351·92	310	Jr. 4	243, 348 ..	Jerseyholm Handsome Boy 3rd
Sylvan Hill Opal	59606	26.9.37	9	6,569	6·02	395·60	270	Jr. 3	331 ..	Jerseyholm Handsome Boy 3rd
Sylvan Hill Sunlight ..	55383	9.11.37	5	4,094	5·98	244·88	310	Jr. 4	264, 302 ..	Sylvan Hill Starlight's Pride
Sylvan Hill Thelma ..	46308	8.11.37	15	6,954	5·17	359·32	350	Mature	268, 371, 330 332	Somerville Heir Apparent
Sylvan Hill Waterlily ..	38287	12.12.38	15½	5,432	5·55	301·30	350	Mature	387, 348, 370, 304, 347	Somerville Heir Apparent
Stirling, H. V., Meade, Jersey (1).										
Coimbra Silvermine ..	56854	19.10.37	19½	8,084	4·85	391·96	250	Sr. 2	338 ..	Banyule Triplane

* 210 days in test. † 240 days in test (herd withdrawn). ‡ 240 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Stoney, W. B., Drouin, Jersey (6).										
Edmonton Trixie's Lass 2nd	33215	26.9.37	7	4,580	6·05	277·03	350	Mature	278, 198 ..	Rarius of Edmonton
Tarago Bonnie 2nd ..	59628	1.11.37	10½	4,766	5·67	270·15	270	Jr. 3	172 ..	Kingsvale Dolly 4th's Son
Tarago Foxglove	50768	5.11.37	16	6,914	5·16	356·92	350	Mature	246, 315 ..	Handsome Boy 12th of Jerseyholm
Tarago Gem	42113	5.10.37	7½	6,582	5·11	336·33	350	Mature	177, 202, 272	Wompini Metalmaster
Tarago Mystery 5th ..	Vol. 25	1.12.37	14	5,687	4·85	275·97	250	Sr. 2	.. ..	Tarago Handsome Boy
Tarago Wildflower 3rd ..	59632	8.10.37	12	5,871	6·44	377·85	310	Jr. 4	299 ..	Glenesk Eminent's Lightenin 2nd
Tait, W. G., Dreeite, Jersey (1).										
Glen Iris Belladonna ..	39834	20.12.37	N.O.C.	5,391	4·99	268·92	350	Mature	.. ..	Glen Iris Bowbells
Tomasetti, B. G., Drouin West, Ayrshire (2).										
Glencorrin Enid	C.R.	16.11.37	6	5,913	5·25	310·55	270	Jr. 3	228 ..	Scotswood Michael 2nd
Glencorrin Gracie.. ..	C.R.	25.10.37	20	7,082	4·36	308·77	230	Jr. 2	.. ..	Tregorland King
Trevaskis, F. T., Tongala, Jersey (7).										
Ballara Dainty	42856	25.11.37	8	4,794	4·80	230·09	350	Mature	.. ..	Brucevale Lord Fancy Madeira
Ballara Dainty 2nd ..	51628	7.11.37	7	6,091	4·83	294·23	270	Jr. 3	.. ..	Kyora Dream's Gadget 2nd
Ballara Flower 5th ..	47094	30.9.37	5	5,718	4·62	264·21	290	Sr. 3	.. ..	Ballara Neat Lad
Ballara Ideal 3rd ..	28423	6.10.37	9½	7,548	5·17	389·98	350	Mature	272 ..	Brucevale Lord Fancy Madeira
Ballara Model 9th ..	38426	25.11.37	13½	5,444	5·73	311·78	350	Mature	218 ..	Brucevale Lord Fancy Madeira
Ballara Model 11th ..	42862	16.12.37	10	5,115	5·72	292·78	350	Mature	.. ..	Brucevale Lord Fancy Madeira
*Ballara Moira 3rd ..	26253	11.11.37	4	2,970	4·60	136·74	350	Mature	289, 303 ..	Werribee Madeira Cream's Masterpiece
Trewin, J. V., Nathalia, Jersey (1).										
Weir View Greetings 2nd ..	51163	14.10.37	15	5,852	5·05	295·47	290	Sr. 3	238, 345 ..	Belgonia Milk Lad
Vagg, E. J., Leongatha, Jersey (2).										
Bonnay Jessamine's Mona	38974	11.10.37	13	7,914	5·02	397·33	350	Mature	333, 371, 424, 322	Welbourne Handsome Boy
Bonnays Queen's Dulcie ..	56466	19.11.37	13	6,023	5·95	358·43	270	Jr. 3	286 ..	Jerseyinn Edith's Masterpiece
Van Brummelen, J. K., Notting Hill, Friesian (1).										
Bolero Sylvia's Rose Mary	4390	15.10.37	31½	20,430	3·02	617·02	350	Mature	395, 455, 512	St. Albans Queen's Korndyke 2nd
Vaughan Bros., Girgarre, Jersey (3).										
Lynroy Beta 2nd ..	C.R.	25.10.37	10	5,423	5·47	296·39	230	Jr. 2	.. ..	Werribee Laverock
Lynroy Dainty's Gladys ..	C.R.	28.10.37	14½	6,045	6·35	384·02	350	Mature	336 ..	Werribee Laverock
Lynroy Natty	Vol. 25	28.10.37	19½	8,729	6·23	543·86	310	Jr. 4	473 ..	Werribee Laverock
Wade, W. J., Stratford, Jersey (6).										
Glen Iris Golden Viola ..	52818	12.10.37	8	4,602	6·58	302·63	230	Jr. 2	.. ..	Design's Golden Oxford (Imp.)
Inverbroom Empress 2nd ..	48762	1.12.37	17½	7,776	4·57	355·53	310	Jr. 4	350, 376 ..	Economist of Aveley
Inverbroom Empress 6th ..	57761	30.9.37	10½	4,562	6·07	276·83	230	Jr. 2	.. ..	Economist of Aveley
Inverbroom Silver Empress	48764	14.10.37	14½	7,812	4·38	342·47	310	Jr. 4	304, 362 ..	Inverbroom Lord Emperor
Inverbroom Silvermine's Marie	44392	19.10.37	17	9,139	5·21	476·20	350	Mature	429, 455, 495	Economist of Aveley
Inverbroom Silver Muriel 2nd	38483	12.10.37	10½	9,092	4·26	387·46	350	Mature	346, 379, 433, 419, 401	Economist of Aveley
Walker, C. S., Swan Hill, Friesian (1).										
Warwick Lizzie Oakwook ..	C.R.	27.10.37	36	15,685	3·10	486·54	310	Jr. 4	302 ..	Hengest Matador Walker
Walker, C. S., Swan Hill, Jersey (7).										
Grangelea Rose Petal 2nd ..	53022	10.10.37	18	6,228	5·96	371·28	270	Jr. 3	321 ..	Grangelea Creamboy
Warwick Augustus Marie ..	38486	29.9.37	23	8,744	4·20	367·61	350	Mature	339, 433, 348, 379, 337, 398	Chevolet of Banyule
Warwick Beauty 6th ..	Vol. 25	17.10.37	14	4,952	4·54	224·89	230	Jr. 2	.. ..	Warwick Golden Lord
Warwick Bell Bird 3rd ..	55799	18.11.37	21	8,787	4·24	372·38	350	Mature	300, 356 ..	Preston Star King
Warwick Polly 6th ..	C.R.	22.11.37	23	6,836	4·91	335·94	250	Sr. 2	.. ..	Glen Iris Golden Lord
Warwick Polly 10th ..	Vol. 25	27.10.37	14	6,696	4·89	327·31	230	Jr. 2	.. ..	Glen Iris Golden Lord
Warwick Vanilla 2nd ..	Vol. 25	26.10.37	16	5,202	5·36	278·67	230	Jr. 2	.. ..	Glen Iris Golden Lord
Warragul High School, Warragul, Red Poll (2).										
Gipps Marie	2878A	22.10.37	12¼	8,364	3·89	325·61	350	Mature	241, 209, 412, 306, 242	Woodburn Laureate
Gipps Winga	7128A	26.9.37	6½	5,453	4·62	251·78	290	Sr. 3	113, 202 ..	Naranghi Wizard

* 150 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Watson, K., Pakenham Upper, Jersey (4).										
Goronga Farm Jester's Pearl	53006	27.9.37	5	7,593	4·54	344·52	290	Sr. 3	317 ..	Goronga Farm Jester
Goronga Farm Satisfaction's Comet	57527	12.11.37	8½	4,569	5·20	237·63	270	Jr. 3	234 ..	Werribee Reprieve
Goronga Farm Starbright's Satisfaction	57528	7.12.37	13	4,214	5·03	211·83	290	Sr. 3	238 ..	Werribee Reprieve
Moornmoot Modesty 2nd ..	33138	26.9.37	5½	6,230	5·04	313·72	350	Mature	381, 524, 543, 412, 375, 366	Choirmaster of Banyule
Williams, F. A., Bamawm Extension, Jersey (6).										
Ballara Bonnie	33911	3.12.37	27½	9,551	6·10	582·78	350	Mature	402, 565, 629, 634, 691, 615	Bruce Vale Lord Fancy Madeira
Bamawm Fancy Gem ..	47100	18.11.37	20½	7,980	6·15	490·39	310	Jr. 4	357, 412 ..	Bamawm Leon
Bamawm Mayflower ..	47101	26.10.37	13½	7,311	5·49	401·67	310	Jr. 4	390, 450 ..	Bamawm Leon
Bamawm Pretty Lady ..	56239	8.10.37	13½	5,393	6·09	328·59	270	Jr. 3	366 ..	Bamawm Master Gaypiece
Bamawm Princess Pamelia	47103	20.10.37	15	7,661	5·26	402·88	350	Mature	386, 404, 415	Bamawm Leon
Bamawm Ruth	Vol. 25	9.10.37	20½	7,403	5·43	402·19	250	Sr. 2	.. ..	Bamawm Leon
Wilson, A., Port Fairy North, Ayrshire (4).										
Carracoorte Balm 11th ..	19679	26.9.37	4	8,052	4·30	346·37	350	Mature	90, 388, 363, 357	Gerty's Producer of Carracoorte
Carracoorte Blanche 12th ..	29202	16.10.37	9½	5,352	4·98	266·73	290	Sr. 3	243 ..	Gerty's Producer of Carracoorte
Carracoorte Bunty 13th ..	19688	13.12.37	10½	6,437	4·08	262·73	350	Mature	295, 212, 307, 290	Blue Belle's Pride of Carracoorte
Carracoorte Fuchsia 11th ..	28172	26.9.37	6	5,678	4·31	244·69	270	Jr. 3	221 ..	Grandview Bernie

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